

INTELLIGENT ADAPTIVE ENVIRONMENTS: PROPOSAL FOR INCLUSIVE,  
INTERACTIVE DESIGN ENABLING THE CREATION OF AN INTERCONNECTED  
PUBLIC OPEN SPACE ON THE IRON HORSE TRESTLE INTERURBAN-RAILROAD-  
SUBWAY [ST. LOUIS, MISSOURI]

by

JEREMY K. ANTEROLA

A REPORT

submitted in partial fulfillment of the requirements for the degree

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Approved by:

Major Professor  
STEPHANIE ROLLEY, FASLA, AICP



## Abstract

Economically insecure times require reduction of energy and land consumption, enhancement of socio-economic and environmental quality of life, and reutilization of neglected existing structures and sites. Traditional planning and design dictates through top-down policy and ordered master planning. In contrast, interactive smart technology simulating human cognitive reactions offers an alternative design framework - an intelligent, adaptive environment – capable of redefining contemporary public open space design.

Traversing through the neglected Fifth Ward north of downtown St. Louis, the adaptive reutilization of the abandoned Iron Horse Trestle interurban elevated railroad and subway applies the Sense Respond Adapt Mutate Emerge conceptual framework (the S.R.A.M.E. Strategy) by utilizing existing resources to create an interconnected, emergent open space network.

Ten unique sites along the Iron Horse Trestle are initially embedded with sensory devices capable of gathering and synthesizing learned information. The real-time actions translate into physical structural responses. The site specific reactions extend outwards as structural adaptations to indeterminate changes from trail users. The evolving structural form connects and mutates the existing structure. Similar to a Choose your own adventure gamebook, the Trestle's open-ended and reactive programmatic strategies emerge as a series of potential options for future inclusionary, interactive designs.

By selectively enhancing, creating, or enabling an open space system reacting to real-time actual user needs over time directly along the Trestle line, the S.R.A.M.E. Strategy offers a potential alternative framework for the indirect revitalization of neglected infrastructural and economic conditions, a residential rejuvenation catalyst, and future socio-economic and ecological sustainable living pattern education tool.

The Trestle's revitalization serves as an education tool critiquing contemporary landscape architecture and general design practice - the static, dictated, and consumptive. Intelligent adaptive environments offer an alternative framework enabling interactive design decision making capabilities to the users as options evolving over time.

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applying an

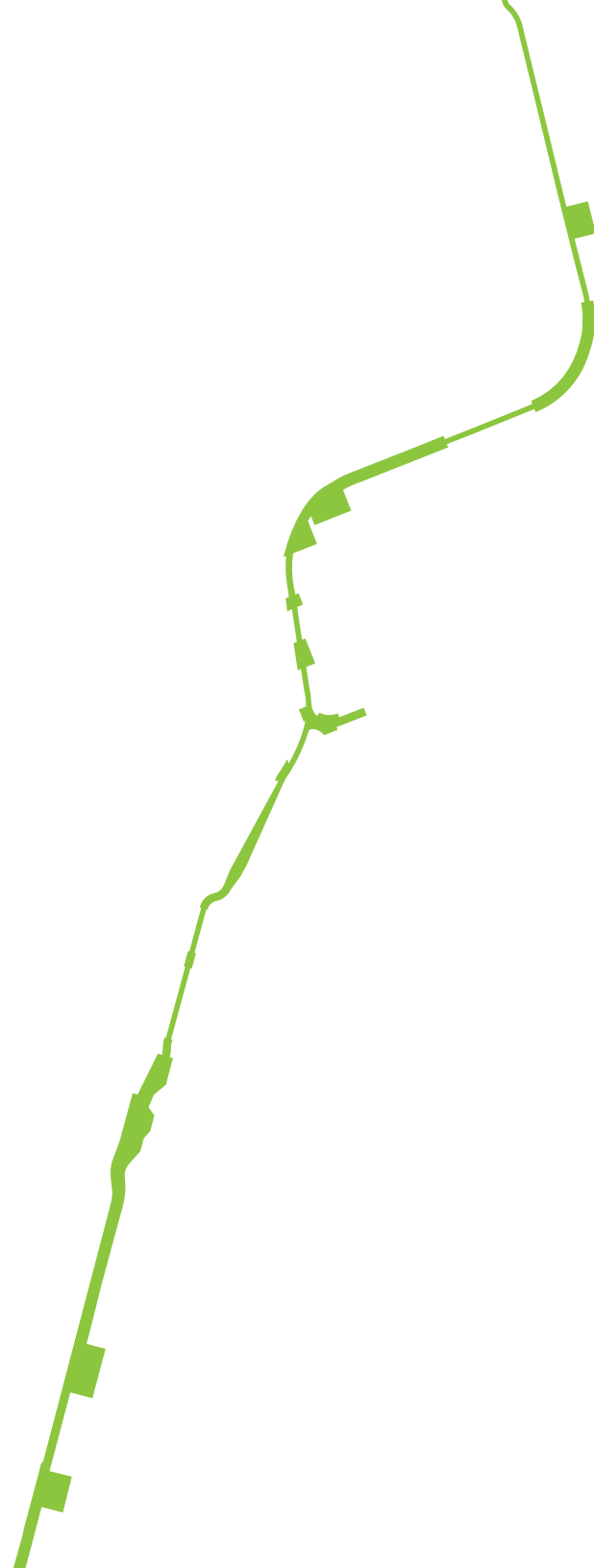
intelligent adaptive environment

on the iron horse trestle elevated railroad.

the film should play automatically. please be patient as the movie loads.









[SENSE RESPOND ADAPT MUTATE EMERGE]

# what

happening to the contemporary city?



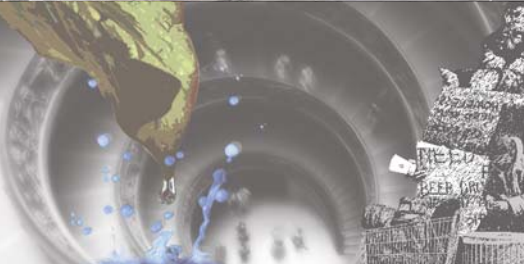


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the virus infecting the future?



# what

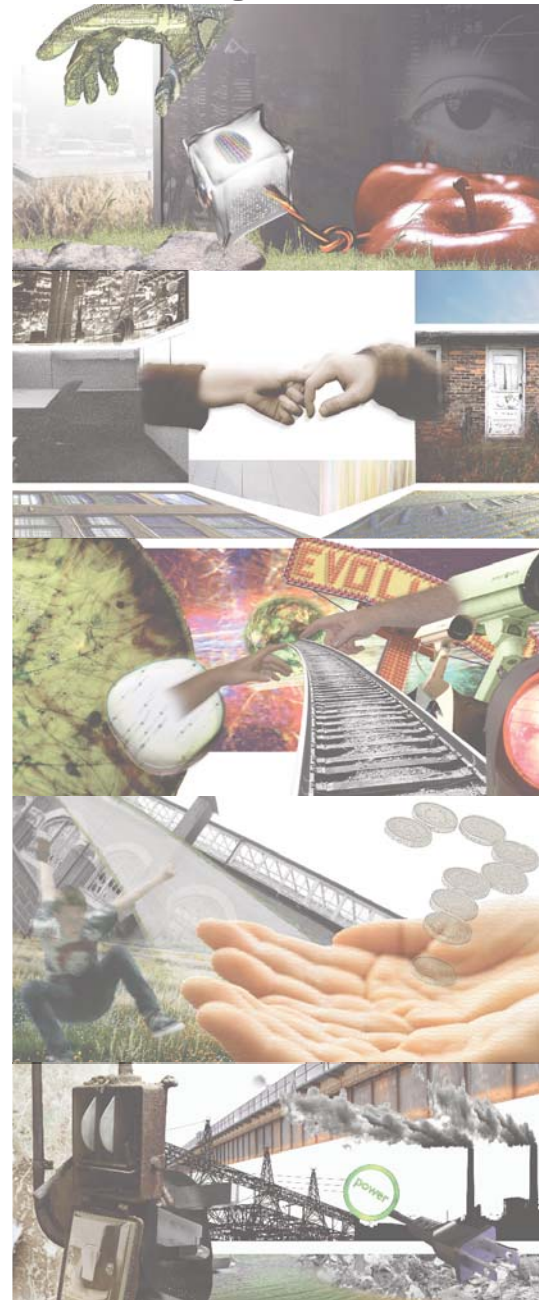
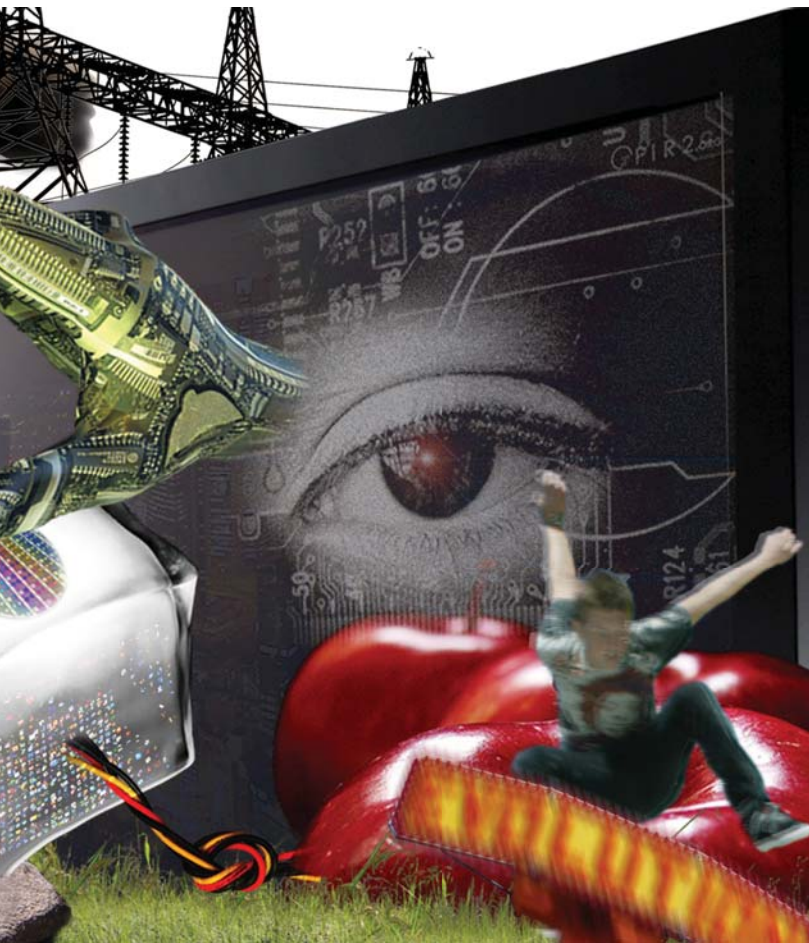
there is an alternative method to design?





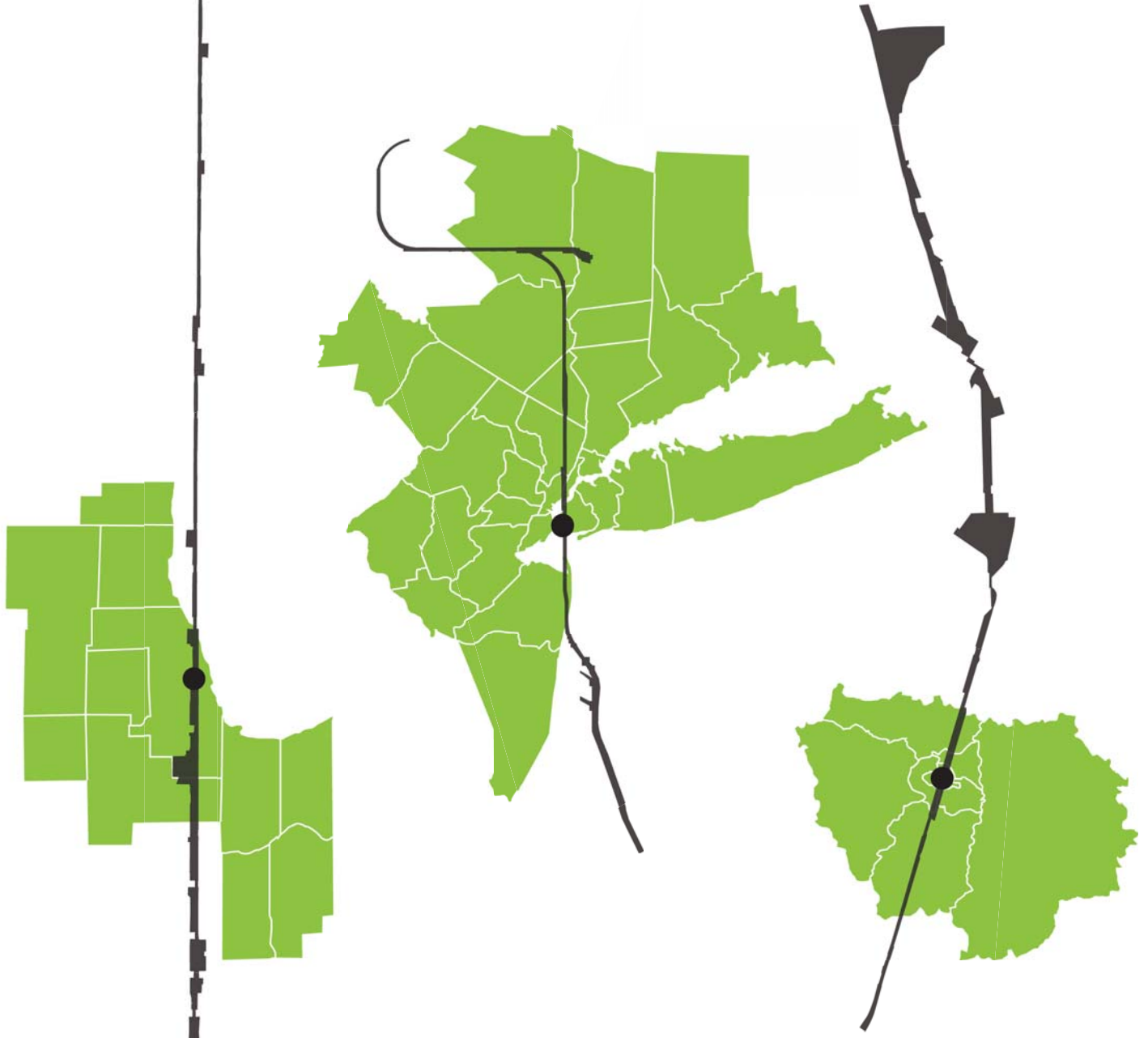
if

we redefine our approach to open space design?



# what

we adaptively reuse the wasted and neglected?



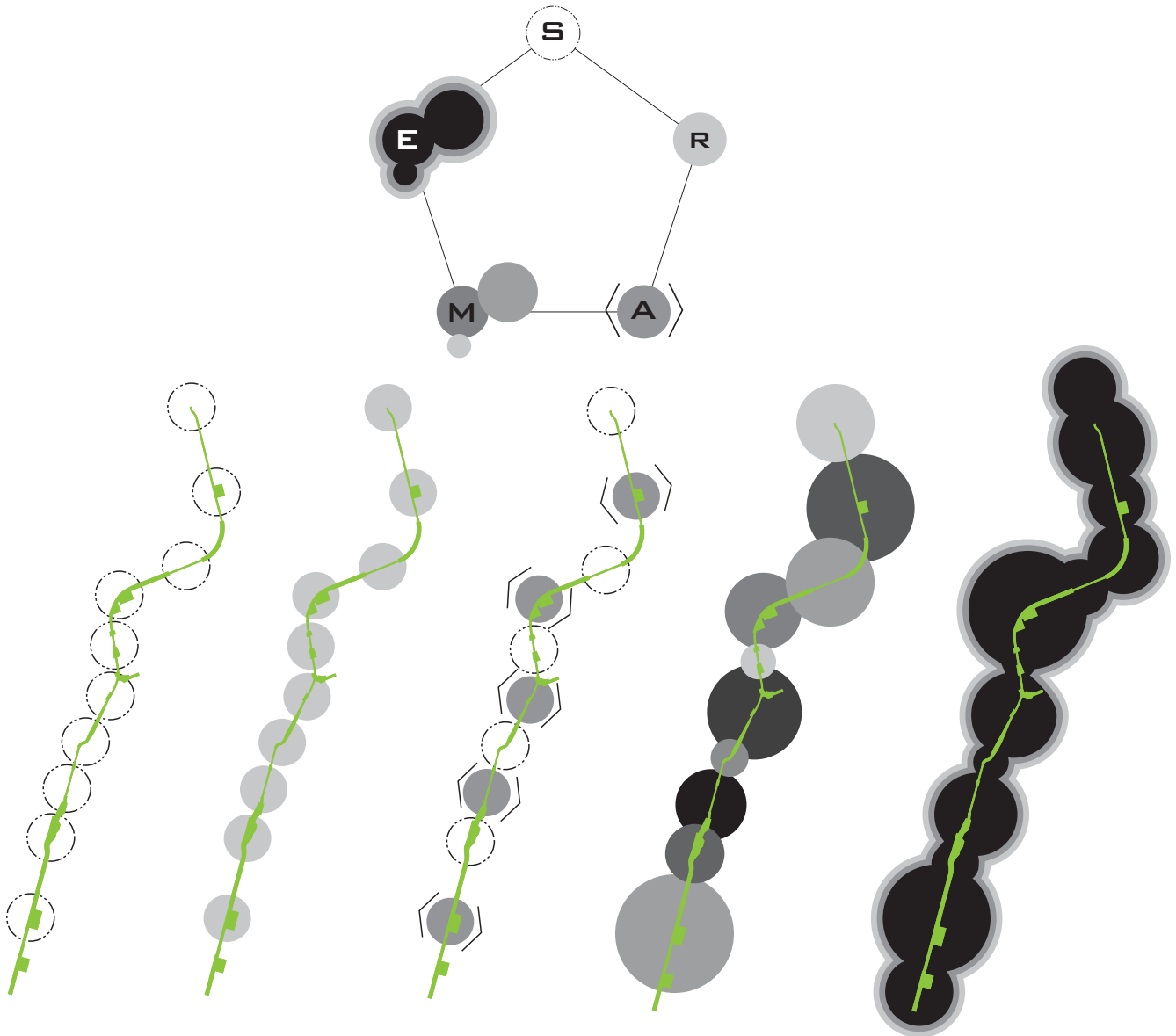
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our design's interact and evolve over time?

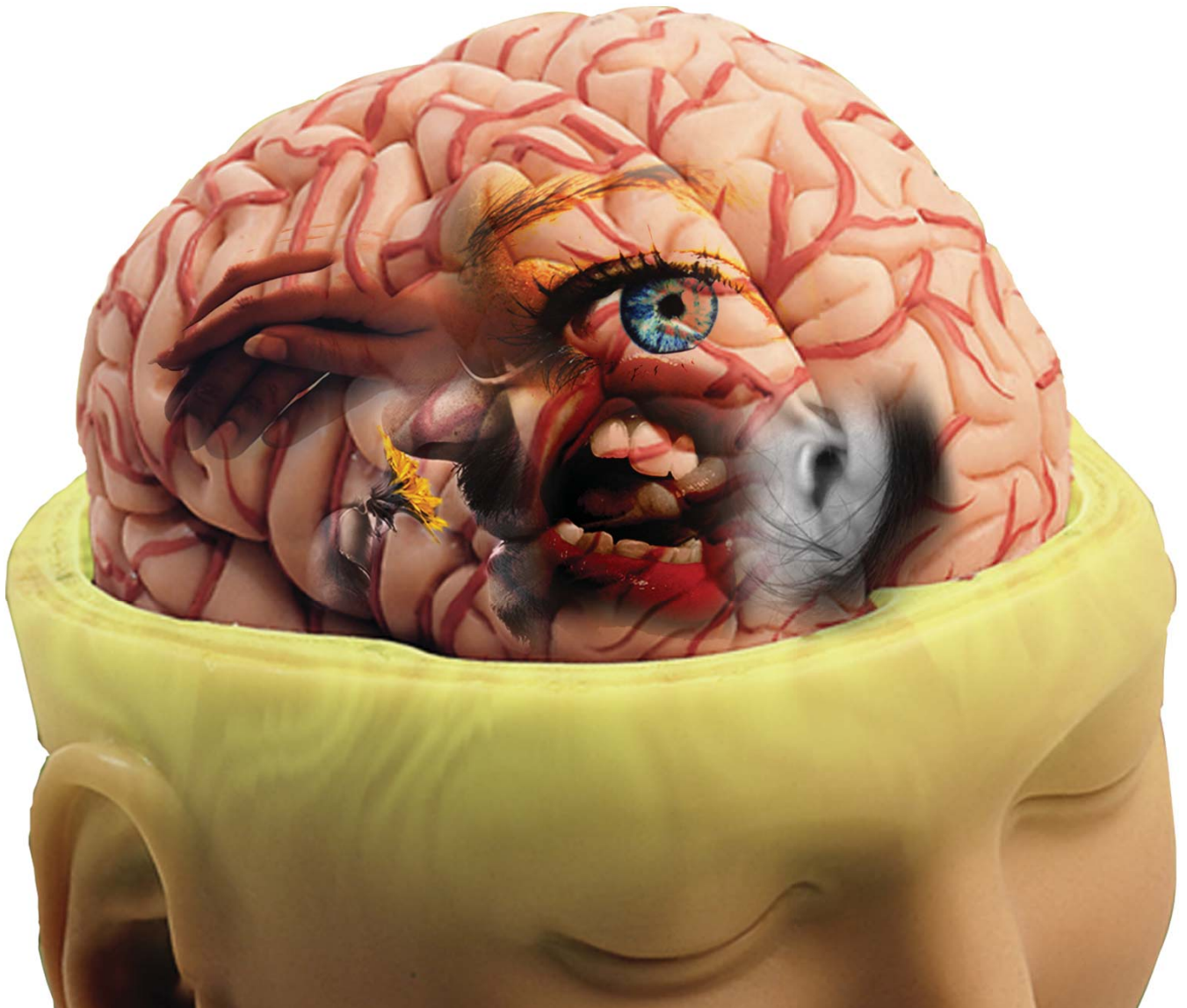


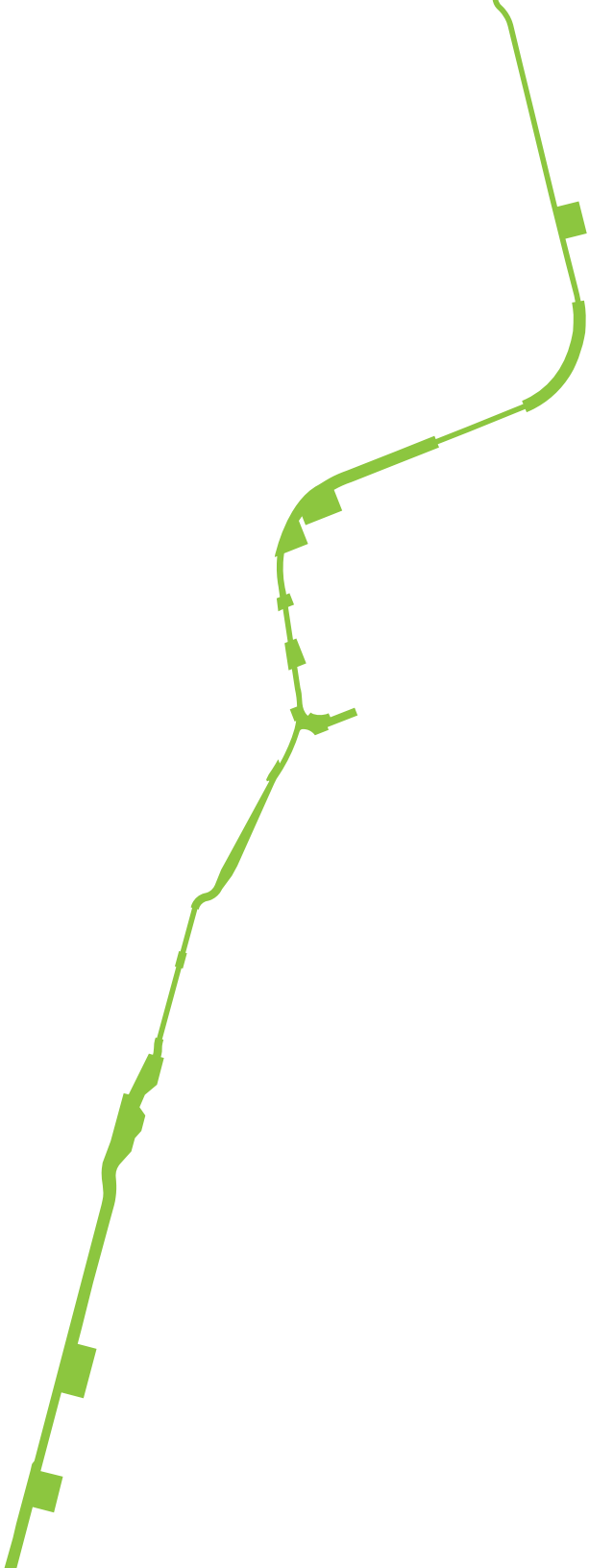
# what

design's sense, respond, adapt, mutate, and emerge?



i f  
the solution lies in intelligent, adaptive environments?





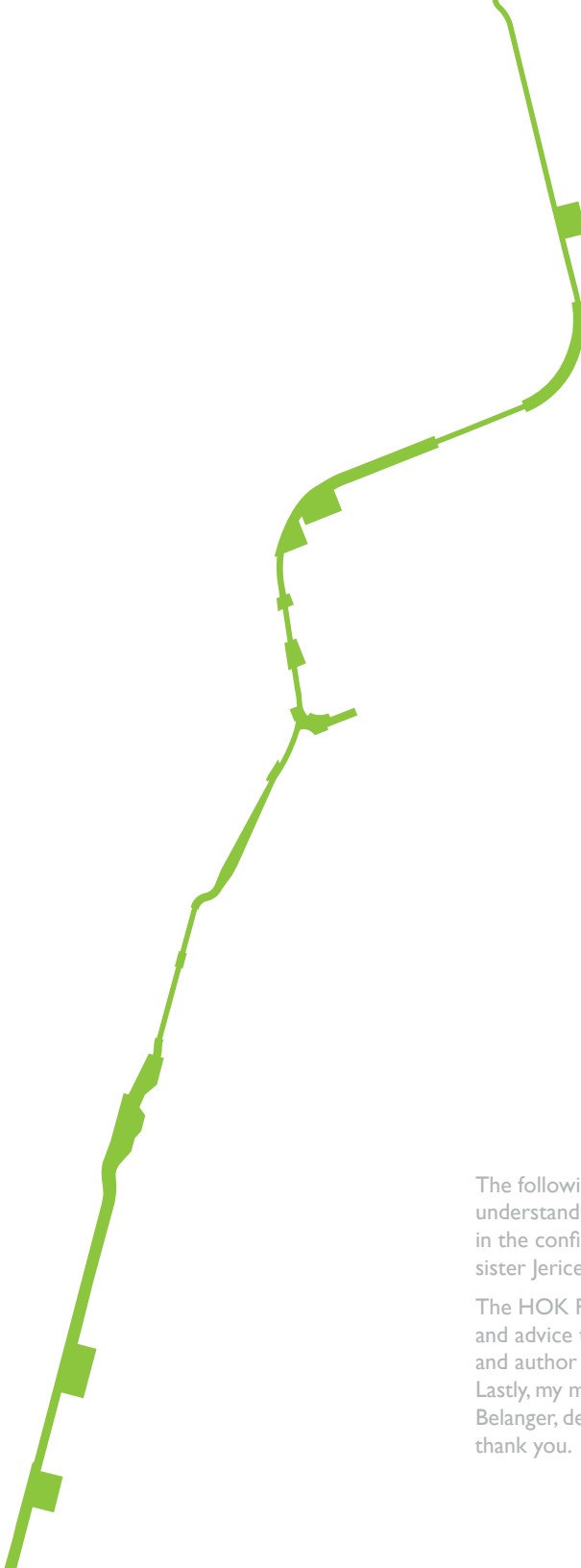


# [INTELLIGENT     ADAPTIVE     ENVIRONMENTS]

iron horse trestle | interurban elevated railroad and subway  
fifth ward | st. louis | missouri

presented by jeremy anterola  
may 11, 2009

kansas state university  
master of landscape architecture  
fall 2008 | spring 2009



The following undertaking would not have been possible without the patience and understanding of both family and friends - for the late nights, missed calls, and weeks trapped in the confines of Seaton Hall. This report is dedicated to my parents Ricardo and Cecilia, sister Jerice, dog Jake, my aunt Linda and uncle Jesse, and my extended family here and abroad.

The HOK Planning Group, notably Mark Vogl, has been essential in base information, research, and advice through the past year. Also, William Bailey of the St. Louis Planning Department and author of the *Illinois Terminal Railroad* Dale Jenkins have been helpful research resources. Lastly, my master's report committee members, specifically Stephanie Rolley and Blake Belanger, deserve special recognition. For putting up with the musings, thoughts, and ideas - thank you.

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## abstract

Economically insecure times require reduction of energy and land consumption, enhancement of socio-economic and environmental quality of life, and reutilization of neglected existing structures and sites. Traditional planning and design dictates through top-down policy and ordered master planning. In contrast, interactive smart technology simulating human cognitive reactions offers an alternative design framework - *an intelligent, adaptive environment* – capable of redefining contemporary public open space design.

Traversing through the neglected Fifth Ward north of downtown St. Louis, the adaptive reutilization of the abandoned Iron Horse Trestle interurban elevated railroad and subway applies the *Sense Respond Adapt Mutate Emerge* conceptual framework (the S.R.A.M.E. Strategy) by utilizing existing resources to create an interconnected, emergent open space network.

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By selectively enhancing, creating, or enabling an open space system reacting to real-time actual user needs over time *directly* along the Trestle line, the S.R.A.M.E. Strategy offers a potential alternative framework for the *indirect* revitalization of neglected infrastructural and economic conditions, a residential rejuvenation catalyst, and future socio-economic and ecological sustainable living patterns education tool.

The Trestle's revitalization serves as an education tool critiquing contemporary landscape architecture and general design practice - the static, dictated, and consumptive. Intelligent adaptive environments offer an alternative framework enabling interactive design decision making capabilities to the users as options evolving over time.

**intelligent, adaptive  
environments**

**redefining public space  
and open space**

**dynamic, interactive,  
emergent technology**

**enhancing blighted  
urban areas**

**infrastructural adaptive reuse**

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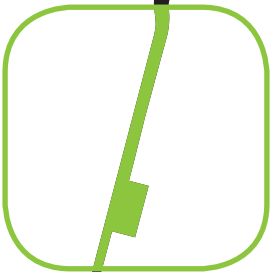
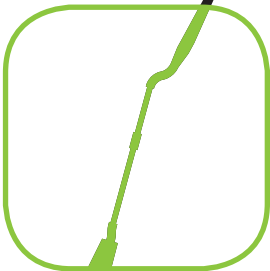
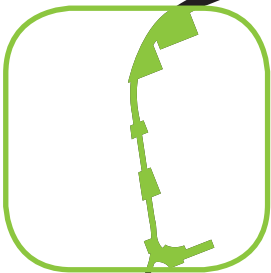
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# explore

Chapter 1 explores the issues surrounding contemporary design, the city of St. Louis, and potential solutions for the adaptive reuse of the abandoned Iron Horse Trestle. Formed from research into open space design and interactive technology, the S.R.A.M.E. Strategy is applied and tested as an alternative conceptual framework.

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EXPLORE



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*In this horizontal field of urbanization, landscape has a newfound relevance, offering a multivalent and manifold medium for the making of urban form, and in particular in the context of complex natural environments, post-industrial sites, and public infrastructure.*

- Charles Waldheim

“Introduction: a reference manifesto” in *Landscape urbanism reader* 2006, 15



# D I L E M M A



## the contemporary city [trials and tribulations]



Nan Ellin states that current city conditions “are manifested as sprawl, the growing perception of fear, a declining sense of community, and environmental degradation” (Ellin 2006, 1). The city has shifted from formal organization structure to uncoordinated development. Master planning is readily assumed as the absolute solution to complex urban issues.

Contemporary cities have evolved not from a hierarchial Machiavellian land dictation but rather, non-amalgamated parcelization of the post-industrial. Thus, design is never on new land (Giro, Berger). Design as formal order and stability has proved ineffectual, and requires a significant shift in order to prevent irrelevance (Weller, Corner). See f l l.





Mohsen Mostafavi states that the “fact that landscape architecture contains an explicit recognition of the changing nature of the land through time allows the possibility of a productive relationship [with] an urbanism whose conception of time has generally become more implicit and linear” (Mostafavi 2003, 8).

In order to combat post-industrial, static, and responsive design, dynamic situations suggest the need for dynamic solutions. The city is temporal, shifting, and complex; thus the solution must be based upon and subject to change, randomness, and indeterminacy.

While the practice of readapting disturbed sites has grown increasingly common as land and resources decrease, post-industrial remnants grow obsolete, and energy consumption requires reconsideration of traditional construction methods, reusing industrial transportation infrastructure (railroads) is a relatively recent introduction.

## why st. louis? [the virus and the cure]



Cities have begun to realize the potential benefit in converting abandoned rail structures. The past transformations of Paris' *Promenade Plantée* and the current construction of the *High Line* in New York have served as contemporary precedents for the adaptive reuse of infrastructure. The abandoned, approximately 2.5 linear mile *Iron Horse Trestle* interurban elevated railroad and subway is positioned within neighborhoods lacking downtown connections, a functioning commercial and industrial sector dotted with vacant buildings and neglected infrastructure, and discontiguous, isolated, and uncoordinated land development.

Although negative perception of the north and east St. Louis area exists, optimism for the city's future success recently rose with the reception of a 2008 All-American City Award, growing interest in residential opportunities, and numerous proposed and under-construction revitalization projects. See *f 1.2*.

*f 1.2* st. louis' dilemma: an abstraction. composited by designer. images courtesy of [www.flickr.com](http://www.flickr.com). accessed and composited december 2008





The *Fifth Ward Comprehensive Plan* recommends the creation of a strong, vital community with youth and adult social outlets; a self-supportive town preserving the existing fabric; using transportation as a resource; multiple housing types with an appropriate urban density; beautified communities; the ability to attract residents, tourists, and businesses; strong progressive education and training; options and opportunities for all ages; and visionary development that are proactive and not reactive to changes.

The virus has had time to develop and mature, and may override its host.

How can a derelict area – suffering from negative safety perception, high vacancy and abandonment, and low population density and resident outflux – revive itself in the face of economic insecurity, post-industrial remnants, and undeterminable future structural and programmatic evolution?



# T H E S I S



**a theoretical proposal [s.r.a.m.e. strategy applied]**



Is there a role for an alternative method of design?

How can we utilize and revitalize our abandoned, wasted, and neglected?

Can our designs respond to active use as opposed to static object implementation?

What happens if our designers respond and evolve through interactive, intelligent measures?





Implementing interactive, smart technology simulating human cognition to external stimuli offers an alternative design framework for the enhancement of blighted urban areas.

Intelligent technology *senses* change; *responds*, *adapts*, and *mutates* in reaction; and conveys the learned information through *emergent* strategies evolving over time.

Applying the S.R.A.M.E. Strategy creates a linked open space system, implements a thinking system along abandoned railroad infrastructure, and enables future growth by catalyzing sustainable economical and residential development. The Trestle shall redefine contemporary public open space design as an inclusive, participatory, and undeterminable evolutionary process dependent on use for change. See *f 1.4*.

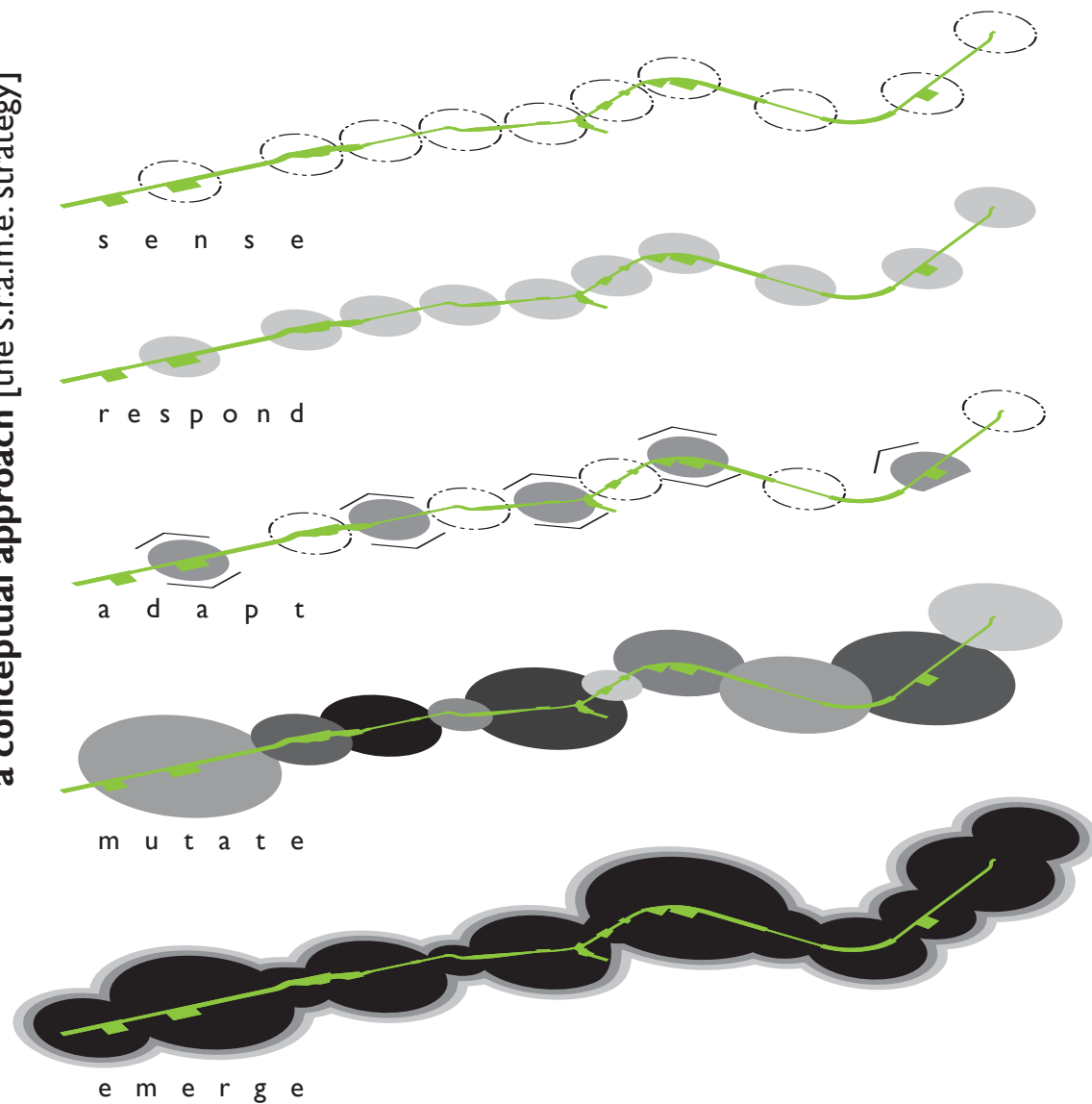




# FRAMEWORK

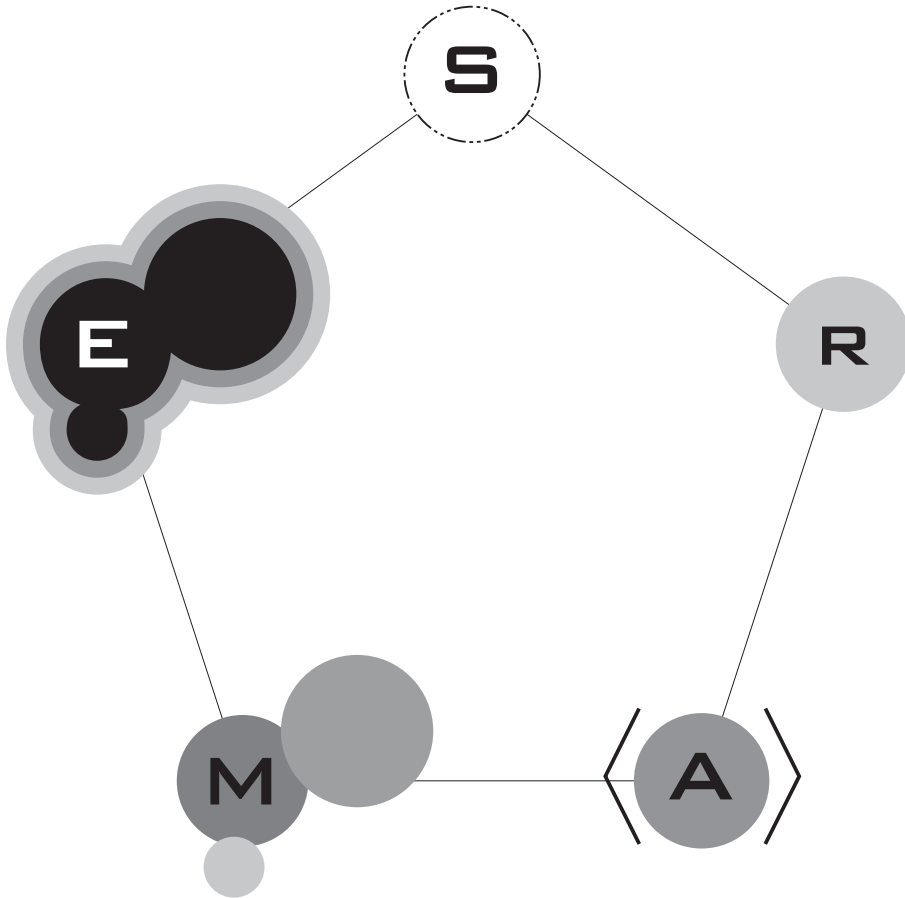


## a conceptual approach [the s.r.a.m.e. strategy]



What is the impact of implementing intelligent adaptive mechanisms as a design method? Can physical structures be deployed, embedded, and utilized for information gathering and user informed decisions?

There may exist an Orwellian-tendency for hesitancy when implementing intelligent dormant structures (i.e. Can Big Brother see me? Is the machine coming alive? What happens if the system takes control?). However, in a contemporary world where connection and networks define cities more so than urban block and building, it is ever more necessary to employ efficient, improved design decision making capabilities in latent structures.



The connective system exists as an interconnected network. When linked, a synergetic relationship produces successive evolution. A sensing structure recognizes change, leads to a responsive, adaptive, and mutative technological change, and finally, emerges as a productive, interconnected system. See f 1.4. Without one method, there cannot be another. However, the cycle is not one-way but rather, cyclical. One may spawn the other yet without all pieces, the system is not complete.

The implemented tools define technology as not simply any computerized, digital mechanism. Technology is understood as any implemented or emergent system - architectural, structural, or natural. Thus, a computerized sensor reaction is as much a function of technology as a plant network. The *digital* and the *analog* - similar to the struggle of *city* and *nature* - may seem distinct and separate areas but ultimately, when combined, form an immersive, intelligent, thinking structure. See f 1.5.

At one point in time, any new development was considered 'technology.' With use and acceptance, the term fades and becomes more of a *tool*. The proposed systems may not yet be realized as constructable but are indicative of the conceptual idea enabling the creation of a linked participatory public open space system.

## defining methods and means

*Intelligence* is defined as the ability to translate stimuli into usable data, interpret results, and provide feedback.

An *intelligent system* moves feedback from simple reactions to proactive decision making capabilities. Intelligent systems mimic human behavior, respond and adapt to presented stimuli, and make decisions based on anticipated and undetermined future outcomes.

*Environments* are defined as the collection of elements comprising a defined site. Environments can range in scale from single-family residences to whole blocks complete with building, landscape, and infrastructure.

The implementation mechanisms (i.e. the *technology*) is understood as not just the digital, computerized, and electronic. At one point in time, any new strategy or device was termed 'technology.' Thus, technology is equivalent to any strategy that has the capability or can indirectly think, learn, and decide.

## implementing s.r.a.m.e.

An intelligent infrastructure is a reactive, adaptive mechanism. It comes alive - literally - when actively used. Like a graphic user interface (G.U.I.) that allows users to manipulate and combine elements to form successive patterns of interaction between human and computer, the revitalized *Iron Horse Trestle* and the implementation of 'intelligent' design introduces a thinking, cognitive, human-esque quality to the environment.

## sensing

Intelligent systems must first *sense*. Embedded materials (i.e. currently electronic sensors) can provide real-time feedback from use of the open space system. Existing elements also serve in a sensory capacity; for example, the spreading of pollen or increased use of the site as a natural habitat for animals indicate that the site's quality has enhanced. Two precedents for a sensing mechanism include *Spots* and *Braincoat*, the first an interactive media wall and the latter wearable devices. See *fl.6*.

## responding

After interpreting results, the intelligent environment can effectively *respond* with a proactive solution. Responsive technology provides a setting for increased human interaction. Physical elements can include seat walls, hand rails, or sustainable devices. Structural adaptations can include extending trellis systems, paving changes, or modular growth systems. Digital responses could be embedded within structures or emerge over time. Two precedents for a responding mechanism include *Civic Exchange* and *Loop Space*, the first a modular interactive structural system and the latter an organic structure reacting to changing user needs. See *fl.7*.

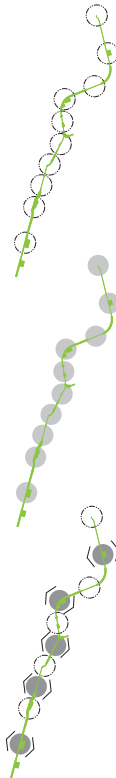
## adapting

Over time, the intelligent environment can *adapt* to evolving user dynamics. Two precedents for an adapting mechanism include *Trans/spot* and *Sim Shun River Thames Pavilion*, the first a modular social education kiosk and the latter a transforming structure capable of changing over time. See *fl.8*.

f l.6 conceptual framework: sense.  
illustration created by designer 2009

f l.7 conceptual framework: respond.  
illustration created by designer 2009

f l.8 conceptual framework: adapt.  
illustration created by designer 2009



## mutating

As the adaptive structures evolve, minute differences occur. The permutations result in minute changes. When positive mutations result, they are termed alternations; if negative, disfigurations. Two precedents for a mutating mechanism include *Ada: the living room* and *Hello stranger*, both capable of sensing, thinking, and even feeling. See *fl. 9*.

## emerging

The methods described thus far are indicative of the real-time, immediate impacts of an implemented intelligent environment system. When combined, the system results in an evolved form - the emergence of an indeterminate but realized form. Direct impacts on the line affect only the Trestle as a public open space system; when the effects radiate outwards, an emergent structure is made aware. Two precedents for an emergent mechanism include *Blur* and *Fresh Kills*, the first a combined structure-site fully responsive to external stimuli of weather and visitors and the latter a proposal for a landscape's brownfield transformation into a potential future public open space. It should be noted that emergent systems are one of the main functions of an intelligent environments. The single implementation strategies of sensing, responding, adapting, and mutating mechanisms make an emergent system possible. The proliferation of sensors translating gained information from users enables the potential for an emergent, unknown environment to develop and perpetuate. See *fl. 10*.

## anticipated outcomes

The goal of an *implemented intelligent environment system* is the creation of more efficient, user-determined, proactive design that evolves over time. The theory is critical of static, complacent, lifeless design solutions and offers a dynamic solution. The initial stages of an intelligent environment focuses on the built outcomes, feedback strategies, and implementation methods. Over time, as processes blur, the strategies are intended to intelligently adapt. The undeterminable future cannot be predicted but the implementation of initial strategies is essential.

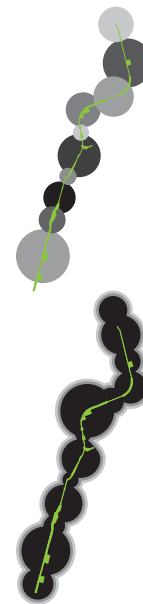
Although the implemented mechanism on the trail do not have a direct time frame, their intelligent capabilities are interconnected and rely on each other to continue. The open space system provides a healthy link through the urban core while simultaneously benefitting (albeit indirectly) local businesses, stimulating residential growth, and serving as a model for future, sustainable, contemporary park designs.

## implications for a future design strategy

When combined, *intelligent environments* suggest a theoretical approach to an interconnected, interactive system that provides real-time design decision visualization. The system initiates through human use, provides immediate structural responses, evolves over time through information gathering and interpretation, and emerges as a linear public open space system influencing adjacent developments.

Intelligence immediately impacts the public open space system. The significance of the system is in its ability to directly respond to users. Each action produces a reaction. When people use the site, there is motion and activity; without users, the site lies dormant but still waiting.

The direct impact is further enhanced by the more significant indirect impact of implementation. Creating a connected open space scheme through an urban core - especially in a city lacking the link - enhances, revitalizes, and stimulates current and future growth. See *fl. 11*.



f 1.9 conceptual framework: mutate.  
illustration created by designer 2009



f 1.10 conceptual framework: emerge.  
illustration created by designer 2009



f 1.11 the thinking, sensing, learning city: an intelligent environment applied. composited by designer. images courtesy of [www.flickr.com](http://www.flickr.com). accessed and composited december 2008

## design process methodology

The adaptive reutilization of the Iron Horse Trestle interurban elevated railroad and subway is a three-part feedback loop process. Occurring along a linear path curving and weaving with no defined end or beginning, the design process took a similar journey. See *f 1.12*.

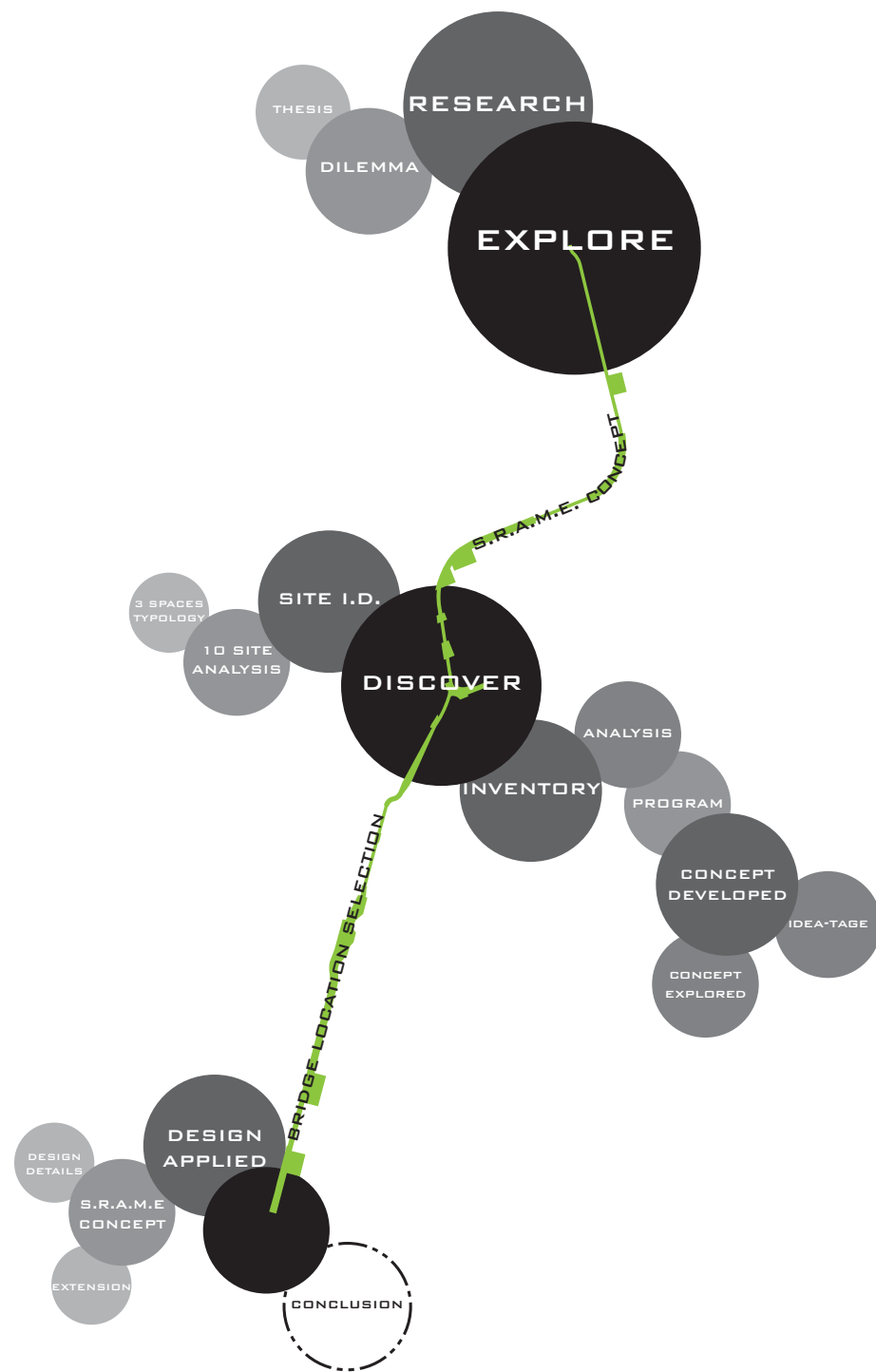
*Explore* synthesizes the master's project's opportunities, constraints, goals, and issues into a dilemma to be solved. A theoretical thesis (based on precedent study and contemporary landscape architecture theory research) is formulated from an evolving conceptual framework known as the *S.R.A.M.E. Strategy* (Sense, Respond, Adapt, Mutate, Emerge). A hypothetical solution is proposed as a potential successful strategy.

*Discover* catalogues and analyzes found conditions, forms a programmatic approach, generates abstract idea-stage representations, and translates concepts into applicable site solutions. During the *discover* stage, the site boundaries are confirmed, three structural types are characterized, and ten unique and distinct sites are identified for further investigation.

*Propose* tests the *S.R.A.M.E. Strategy* on a single site to display the application of a conceptual framework on an actual site. Confirmation of successful site application leads to details and extensions of the conceptual framework on the nine other sites.

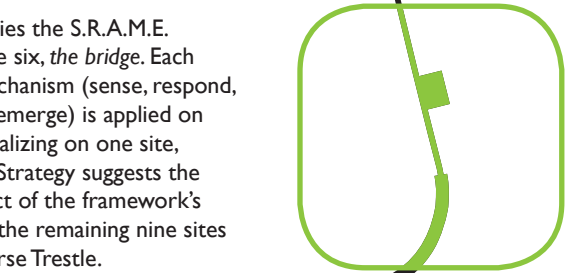
Conclusions summarize findings, successes and failures, and potential future endeavors.

The structure of this report presents the *Propose* chapter first, revealing and explaining the design strategies fueled from the research undertaken during the *Explore* and *Discover* stages. The process iterates design solutions by allowing constant feedback between all phases. Few conditions are permanent as the site remains a dynamic system. With each phase and sub-parts influencing future design decisions, the design process can be enriched with multiple layers of social, cultural, economical, historical, and theoretical research.



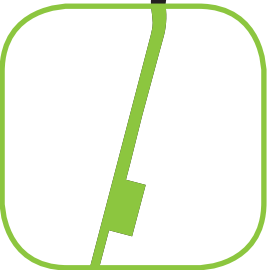
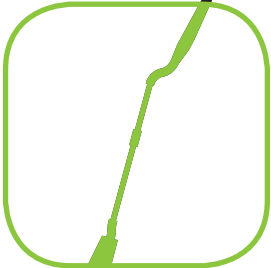
propose

Chapter 2 applies the S.R.A.M.E. Strategy on site six, *the bridge*. Each conceptual mechanism (sense, respond, adapt, mutate, emerge) is applied on site six. By visualizing on one site, the S.R.A.M.E. Strategy suggests the potential impact of the framework's application on the remaining nine sites of the Iron Horse Trestle.



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PROPOSE





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*To make a sand pile on the beach, you can form a mound of sand with a bucket and a shovel, then the mound will disappear with the wind over time.*

*The alternative is to place a large stick in the ground where the wind will instantly form a pile, reshaping the pile every time the wind changes its direction.*

- Roel van Gerwen  
“Force fields in the daily practice of a Dutch landscape architect” in *The mesh book: landscap/infrastructure*, 2004, 233

## state

High concentration of population Kansas City on the west and St. Louis on the east have the highest population density suggesting that population distribution is greatest within and around major metropolitan areas. See *f 2.1 a-b*.

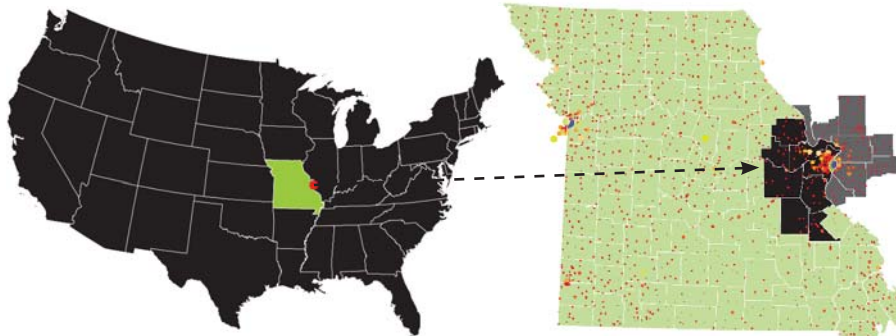
## metropolitan

Highest density concentration occurs within the county surrounding the city of metropolitan, St. Louis County. The population tendency movement suggests people migrate further from downtown towards suburban and sub-urban areas. See *f 2.2 c-d*.

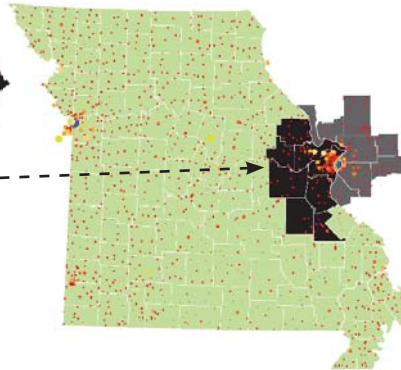
## block group

Highest population density occurs within Carr Square (noted in green). Populations are generally higher when adjacent to the Trestle rail line with surrounding neighborhoods at a density of at least 500 or more citizens (noted in red). Communities with lower population density tend to directly surround the central business district of downtown, along the Riverfront, or within industrial/commercial quarters (noted in various shades of grey).

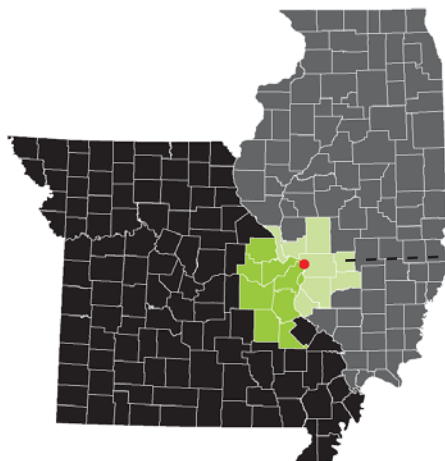
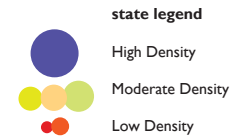
The statewide distribution reveals that higher population density tends to occur in areas with a higher distribution ratio of amenities and facilities for public use. Across the metropolitan, population outflux still seems to dominate with block group data suggesting people are beginning to migrate back into the Fifth Ward and areas surrounding the downtown proper. It is critical to note that eleven years prior, the 1997 report of Neal Peirce and Curtis Johnson suggested a city on the verge of failure; “their published report predicted continued decay, squalor, and decline unless aggressive actions were taken” (Hazelrigg 2008, 149). See *f 2.1 e-f*.



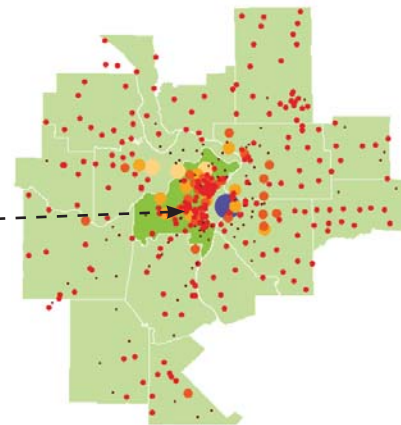
f 2.1a location of site: national. illustration created by designer 2008



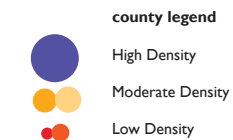
f 2.1b location of site: state and metropolitan region with population distribution pattern. illustration created by designer 2008. population information courtesy msdis



f 2.1c location of site: missouri and illinois within greater st. louis metropolitan area. illustration created by designer 2008



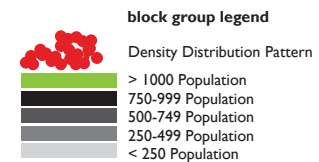
f 2.1d greater st. louis metropolitan area with population distribution pattern. illustration created by designer 2008. population information courtesy msdis



f 2.1e st. louis city county with site location and boundary delineated. illustration created by designer 2008



f 2.1f site boundary and existing trestle located within fifth ward modified block group with population distribution pattern. illustration created by designer 2008. population information courtesy msdis



### general features

The Trestle is located within the Fifth Ward of St. Louis, north of downtown, west of the Mississippi River and the state of Illinois, and east of St. Louis county. The downtown area is approximately one square mile in area, the city approximately 66 square miles, and the metropolitan statistical area approximately 8850 square miles. The Trestle's boundary begins at the southwestern Missouri side of the McKinley Bridge south of the 2007 renovation of the Branch Street Trestle portion. The Trestle's elevated lines move generally north-south, cross Interstate 70 over a rail bridge, transition to ground level at Tyler and 11th Street, and travel on street-rails over three city blocks. The Trestle enters the abandoned subway north of Cass and Hadley, and travels underground to the Midwest Terminal Building depot. See f 2.2a.

### urban block and building

Adjacent to the Mississippi River, the typical industrial-commercial building structure ranges from small one or two-stories to large multiple story heights. Resident density and population is low east of Interstate 70. West of the highway typically are small-medium commercial structures as well as residential units in single-family detached, row houses, and recently revitalized low-income housing. The Trestle ends two blocks north of a main thoroughfare of downtown St. Louis, Washington Avenue. Though no formal line exists, there seems to be a distinct psychological separation between north St. Louis and downtown. See f 2.2b.

### landform and environmental

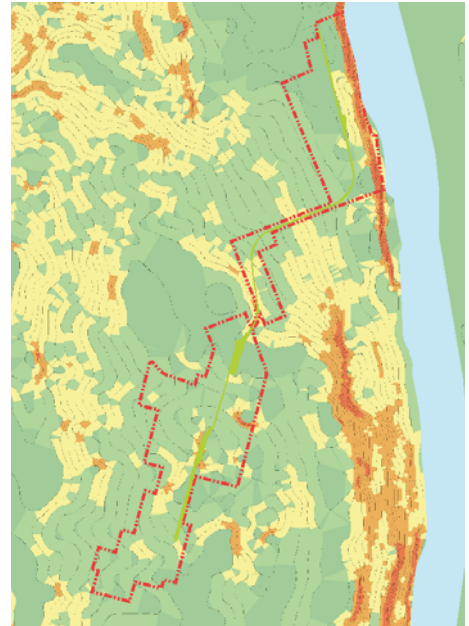
The Trestle lies along what was previously a bluffline separating residential areas on the west with Broadway marking the commercial-industrial sector to the riverfront. Once noted for the live-work, mixed-use characteristics of a walkable neighborhood, the evolution of rail and steam industries led to the decline of the riverfront's prominence and residences east of Broadway. Interstate construction further separated the districts leading to today's existing, isolated, and separated conditions. See f 2.2c.



f 2.2a aerial photograph with site boundary and existing trestle delineated. graphic created by designer 2008. image courtesy msdis



f 2.2b parcel, street, row with site boundary and existing trestle delineated. illustration created by designer 2008. information courtesy msdis



f 2.2c city landform and topography with site boundary and existing trestle delineated. illustration created by designer 2008. information courtesy msdis

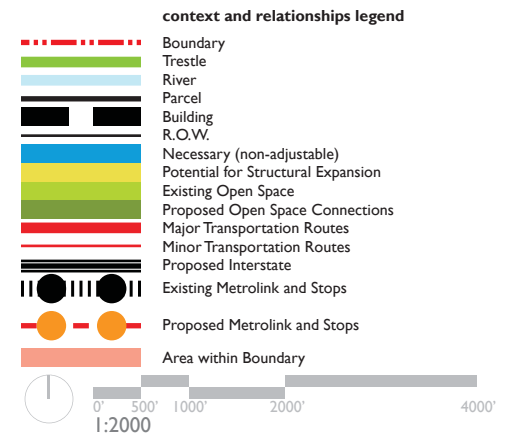




### context and relationships

Surrounding the defined boundary are opportunities for comprehensive ward-wide planning and integrated design development. Note major transportation routes as well as proposed interstate bridge additions. There is a lack of an interconnected open space system. Central businesses and functions serve as district nodes. Proposed Metrolink routes (connected to the existing) are instrumental in planning for future growth or shrinkage. See f 2.2d.

f 2.3 context and relationships map, illustration created by designer 2008, information courtesy msdis



## context [existing]



The Trestle bisects interstate seventy east-west traversing north within a primarily commercial-industrial district and nearly connecting to the revitalized Branch Street Trestle portion that heads west along McKinley Bridge towards Illinois and East St. Louis. The city's building features are primarily of a low to medium height and density. See f 2.4a.



0' 375' 750' 1500' 3000'  
1:1500

f 2.4a whole context map. illustration created by designer 2009. information courtesy msdis





The existing open space system of St. Louis is composed primarily of either dedicated open spaces such as Hyde Park to north, Forest Park to west (not pictured), or leftover unused open spaces. By first identifying existing land undeveloped, neglected, wasted, abandoned, or vacant, the appropriate measures to implement a linked system can be undertaken. Utilizing the Trestle as the main spine and radiating outwards allows for a connected network to be established. The extensions can then influence and enhance adjacent developments. See *f 2.4b*.

context [propose and remove]



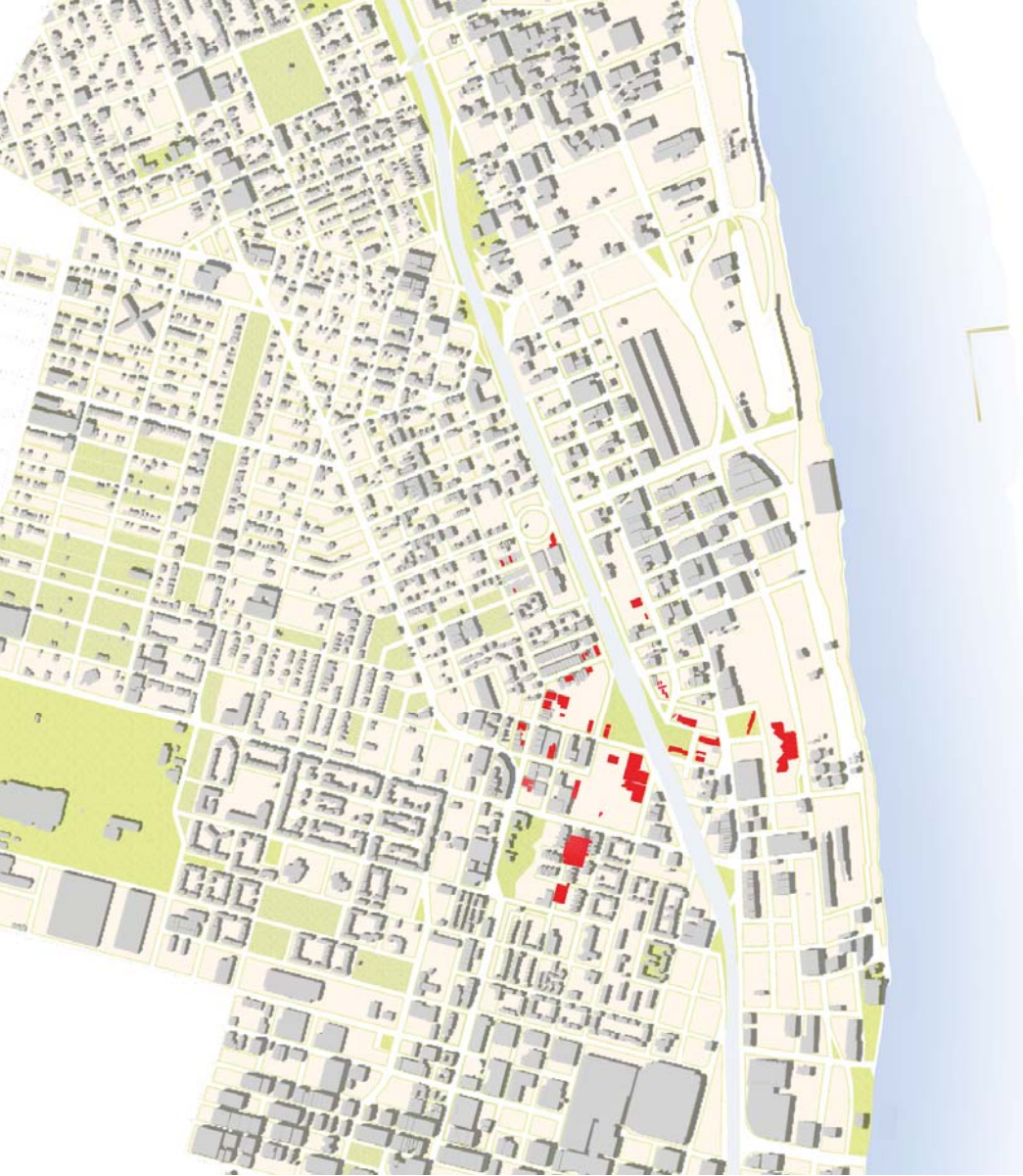
The proposed structural additions adaptively reuse existing structures or paved grey spaces, focus on revitalizing and enhancing the existing surroundings conditions as opposed to creating entertainment or destination centers, and can emerge over time as potential replacements. Located in close proximity to the Trestle main spine line, the proposed buildings are indicative of the potential influence of the open space design for adjacent developments. See f 2.4c.



0' 375' 750' 1500' 3000'  
1:1500

f 2.4c proposed structural introduction, illustration created by designer 2009, information courtesy msdis





Not all existing infrastructure can remain. Current developments, such as the highway extension east-west over the Mississippi towards East St. Louis, require the removal of several structures and realignment of portions of interstate 70. Several residences and commercial structures lie in a state of ruin as structural failure and exposed foundations are typical conditions. See *f 2.4d*.

### three structural character types

Three unique conditions distinguish the Trestle. To the north, closest to the river, and enclosed within the industrial-commercial quarter lies structure type one, *elevated portion*, where the interurban previously traveled above grade. The elevated portion was constructed in order to eliminate 29 dangerous street-level crossings and today is an abandoned, dormant structure.

Structure type two, *transition and ground level*, moves from elevated bridge to street-level for approximately four blocks through a commercial-residential quarter of Old North St. Louis. With plans to construct a new highway parallel to the street level portion, structure type two serves as a transition from the high-elevated rail to the beginning of structure type three.

Structure type three, *subway and street-level extension*, moves towards the Midwest Terminal Building depot and marks structure type three. Moving underground for approximately seven blocks, the subway is currently home to a transient population. See *f 2.5a*.

### ten unique sites

Found within the three structural types are ten distinct sites each with unique physical and sensory qualities.

Structure type one, *elevated*, includes site's one through five. Site one, *gateway*, begins at the connecting link between the Branch Street Trestle and the start of the existing Iron Horse Trestle line. Site two, *elevated working riverfront*, borders the river and transitions from a degraded wooden structure into steel rails. Site three, *elevated industrial quarter*, bisects the industrial district west from the river towards the interstate. Site four, *elevated commercial district*, intersects buildings and structures, and travels over accessible rooftops. Site five, *open space below elevated*, parallels the interstate, moves towards the bridge intersection, and contains unused open space below the rail. Also included in structure type one is a portion of site six, *the bridge*, that travels on an elevated line.

Structure type two, *transition and ground level*, includes site's seven through eight. Site seven, *elevated to ground transition*, transitions southwesterly from elevated to ground level. Site eight, *ground level trackage*, travels over three blocks on ground level tracks through a brownfield and underutilized commercial structures. Also included in structure type one is a portion of site six, *the bridge*, that transitions from elevated line towards ground level.

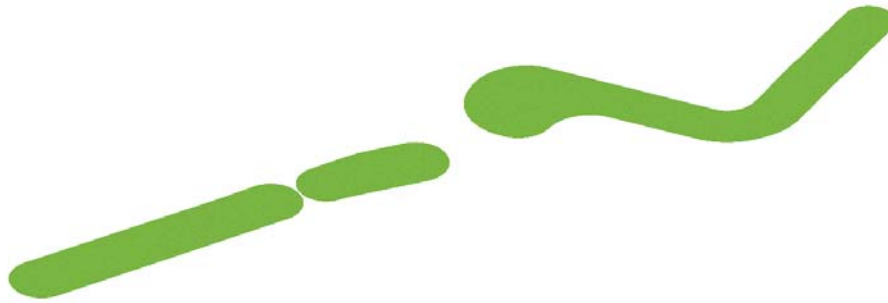
Structure type three, *subway and extension*, includes site's nine and ten. Site nine, *subway transition entrance*, moves from ground level to below grade tracks. Site ten, *underground subway-street extension*, travels wholly underground ending at the Midwest Terminal Building rail depot. See *f 2.5b*.

Site six, *the bridge*, travels over both elevated and ground level, and is included in two groups.

### one connective link

The application of the S.R.A.M.E. Strategy can be realized at all sites. In order to visualize the potential ability of the conceptual framework, the strategy is tested on what is identified as the most visible, accessible, and identifiable marker along the Trestle. Site six, *the bridge*, applies the strategy over the bridge with four direct physical systems (*sense, respond, adapt, mutate*) and two resultant indirect (*emergent*) networks.

The bridge offers the resident, visitor, or passer-by the best opportunity to engage the Iron Horse Trestle, and, if successful, serves as precedent for application over the nine separate sites to form the connective open space link towards downtown St. Louis. See *f 2.5c*.



f 2.4a three structural character types delineated. illustration created by designer 2009



f 2.4b ten unique sites identified within three structural type areas. illustration created by designer 2009



f 2.4c single site identified with highest potential of application of the s.r.a.m.e. strategy. site six, *the bridge*. illustration created by designer 2009



# A P P L I C A T I O N



## application [design process]

Gathered, translated, and synthesized information leads to the testing of the conceptual framework on site six, *the bridge*.

Noted as the primary link transitioning two structural types and located along the most prominent visual point, the design process is systematically layered and analyzed.

### **strategy**

First, key points from the *explore* process, including issues and situations suggested in the two presented dilemmas, the proposed thesis and goals, and the S.R.A.M.E. Strategy solution, are examined and extrapolated based upon relevancy to site six, *the bridge*.

Key points from the *discover* process, including gathered site information and inventory, section-type analysis results, abstract idea and keyword associations, programmatic potentials and locations, and proposed conceptual design elements are next layered and extrapolated based upon relevancy to site six.

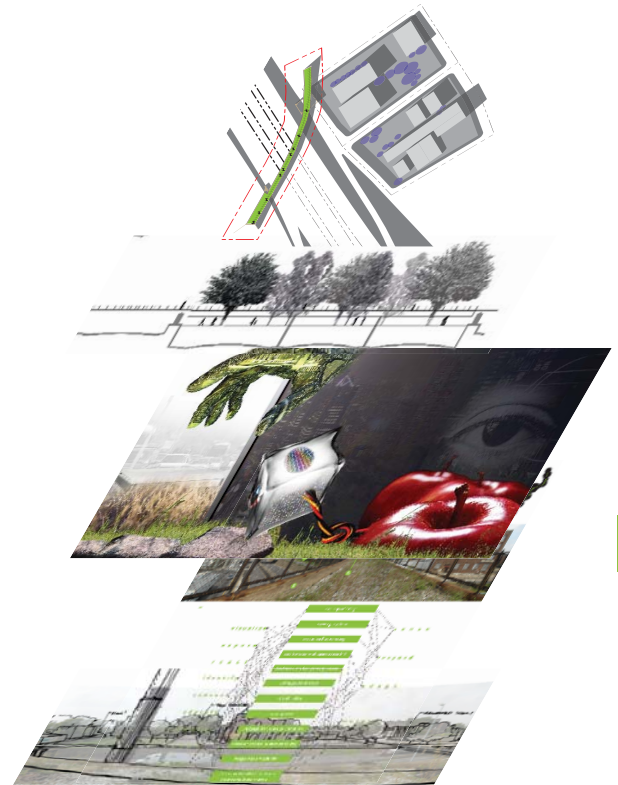
Lastly, *programmatic precedents* are then associated with each conceptual framework strategy keyword, including Spots and Braincoat as applied to *sense*, Loop Space and Civic Exchange as applied to *respond*, Tran/spot and Sim Shun Q4 River Thames Pavilion as applied to *adapt*, Ada: the Living Room and Hello Stranger as applied to *mutate*, and the Blur Building and Fresh Kills Lifescape Park as applied to *emerge*.

Collectively, *discover*, *explore*, and *programmatic precedents* inform the application of the S.R.A.M.E. Strategy to the bridge's future as an intelligent, adaptive environment, and the potential impact to adjacent developments.

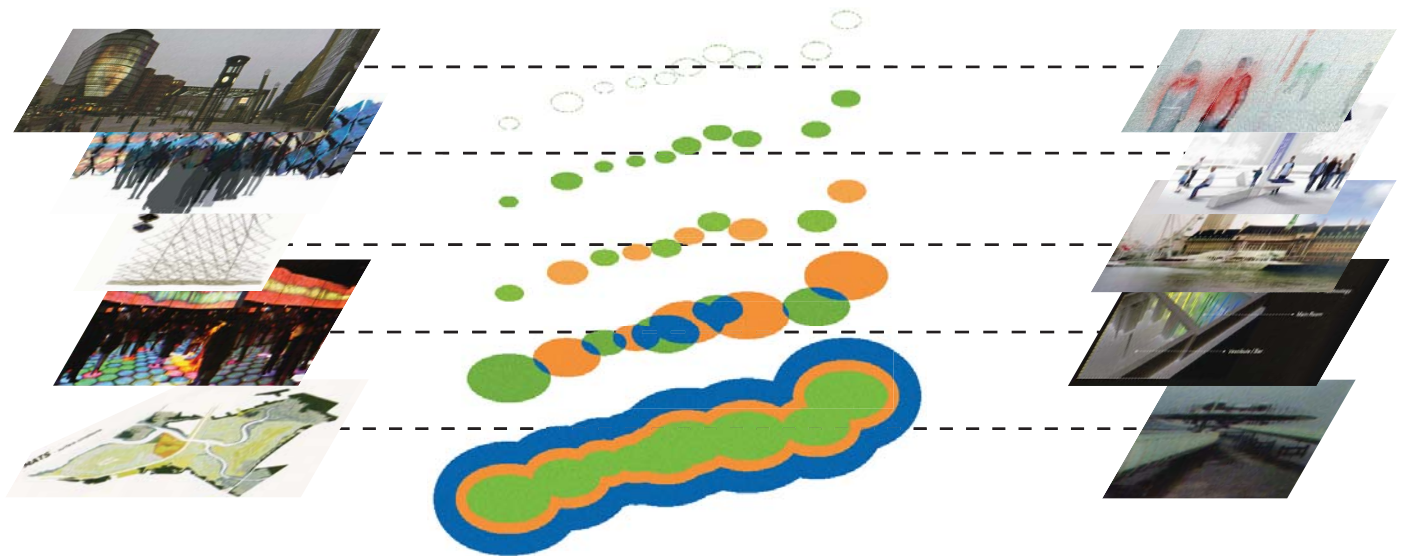




f 2.6a exploded axonometric of explore process. illustration created by designer 2009



f 2.6b exploded axonometric of discover process. illustration created by designer 2009



f 2.6c exploded axonometric connecting conceptual framework to programmatic precedents. illustration created by designer 2009

Extrapolating the *explore* process, three significant points are reiterated within site six.

### **the contemporary city: trials and tribulations**

Why is there such disalignment between land uses? Can there never be a successful medium merging the two together? Site six, *the bridge*, is a crucial link between the forces of industry and residences. If the two were to interact, could there still be a successful neighborhood? Newspapers recount the alternative solutions for integrating live-work neighborhoods proposed prior to the existing Trestle's construction.

If only the entire length were served by subway. If only industry and commerce would halt spreading and focus on concentrating development in necessary areas. If only residential districts were allowed to flourish and industrial growth could increase in moderation. Perhaps the alternatives still exist, awaiting salvation. See *f 2.7a*.

### **so why st. louis?**

The Fifth Ward and North St. Louis in general has been - since the period following prohibition and the two world wars - considered a disconnected, isolated portion of the city separate from downtown.

*Why?*

Is there such a negative perception of the crime, demographics, and aesthetic quality of north St. Louis that the area will remain separate? Will north St. Louis continue with its current development pattern of unmaintained crumbling structures, neglected infrastructure, lack of open space, sporadic construction, and suburban transformation?

In recent years, residents have begun to move back. Can site six, *the bridge*, serve as the first implemented strategy for an intelligent adaptive environment visible to St. Louis' residents, visitors, tourists, sports enthusiasts, Arch-seekers, students, and even its transients? See *f 2.7b*.

### **the thinking, learning, evolving city**

Site six, *the bridge*, has the potential to intelligently sense, respond, adapt, mutate, and emerge as the initial implemented link reinvigorating the Iron Horse Trestle elevated railroad and interurban subway into a functional open space system catalyzing development over time. See *f 2.7c and f 2.7d*.

With cognitive ability occurring directly on the Trestle's existing path system and supplemented by implemented *sensory, responsive, adaptive*, and *mutative* elements, a successful open space system can *emerge* as the catalytic reaction enabling the success of the following goals:

- Catalyze economic revitalization
- Utilize existing resources to enhance quality of life
- Provide sustainable living patterns by encouraging coordinated industrial-commercial-residential growth





f 2.7a the contemporary city: post-industrial waste. composited by designer. images courtesy of [www.flickr.com](http://www.flickr.com). accessed and composited december 2008

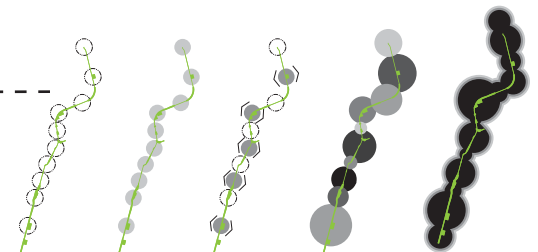
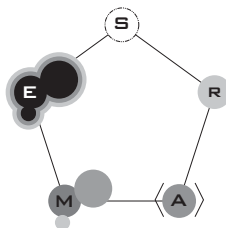


71

f 2.7b st. louis' dilemma: abandoned, neglected, failing buildings of the fifth ward. composited by designer. images courtesy of [www.flickr.com](http://www.flickr.com). accessed and composited december 2008



f 2.7c thesis: the thinking city. composited by designer. images courtesy of [www.flickr.com](http://www.flickr.com). photography from designer. accessed and composited december 2008



f 2.7d conceptual framework: sense. respond. adapt. mutate. emerge. illustrations created by designer 2009

Extrapolating the *discover* process, the following observations are observed within site six.

### location

The bridge's existing structure retains two structural type characteristics within one site. An elevated portion transitioning from east to west over the interstate, the structure connects to a ground directed transition navigable and accessible by potential users. Vehicular traffic will first encounter the bridge when entering St. Louis from the west. With current development in Old North St. Louis continuing, the planned construction of a new on-ramp for the interstate, and continuing prosperity for the industrial-commercial district west of the interstate, the bridge can become a physical catalytic link for the initiation of an interconnected open space system. See *f 2.8a*.

### synthesis

High visibility to vehicular and pedestrian traffic with moderate levels of safety made possible through sound structural conditions, navigable elevations with safety rail supports, and high light levels identify the typical characteristics of the bridge. Beginning at the bridge allows for future strategies to phase safety and security elements east and west towards emergent industrial-commercial-residential mixed use districts. See *f 2.8b*.

### thought

Key to establishing presence and awareness will be the bridge's ability to *visualize* the Trestle's potential as the first stage in an open space link. The realization that the separation of city and nature is similar to comparison of the chicken and the egg is fundamental to establishing and understanding the city-nature interconnected relationship. Primary consideration for surveillance and censorship will continue to be a function of the public-private information accessibility war. Embedded systems must be invisible, easily learnable, maintainable, and memorable, but most importantly, ubiquitous and non-invasive to ensure successful implementation. The plug-in capacity of a structural system such as the Trestle thus seems much more relevant in the application of the digital explosion characterizing contemporary cities: networked, broadband, wireless. See *f 2.8c*.

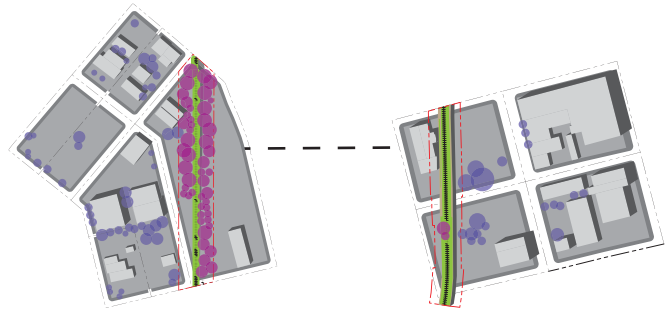
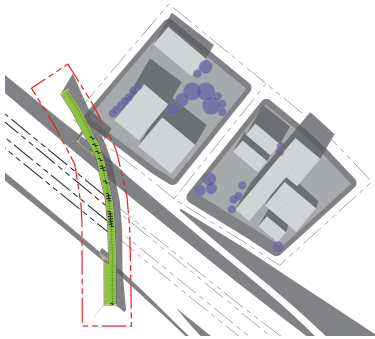
### potential

Real time reactions to stimuli, including media sensory devices, responsive modular functional services, adaptive extending and retracting surfaces, and mutative cognitive learning capable technology, display phase one's application of the S.R.A.M.E. strategy. The emergent property (or the unknown evolution of the system) is crucial in enabling successful adjacent property development. As a connective whole, the system is a unique experience that has positive socio-economical and environmental implications in revitalizing disparate and disconnected areas of a currently reviving downtown. See *f 2.8d*.

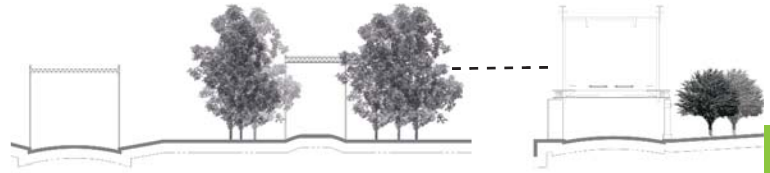
### elements

Digital senses placed on visually prominent locations *sense*. Modular, functional, and sustainable seating, shade, and accessible objects *respond*. Extending platforms to open space and revitalized structures *adapt*. Materials reacting to seasonal and temporal evolution *mutate*.

Residential development reusing existing on-site infrastructure for housing and open space development (west) and functional programmed open space with an event hub (east) lastly *emerges* over time. See *f 2.8e*.



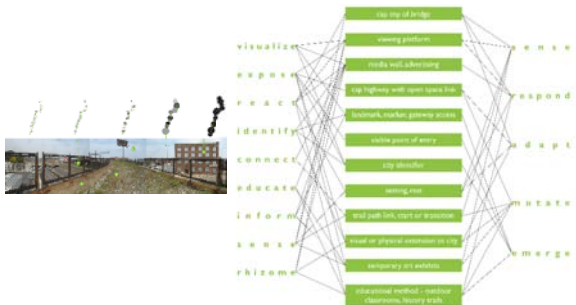
f 2.8a existing condition plan connection to transition-ground level (left) and elevated (right) structural types. illustrations created by designer 2008



f 2.8b existing condition section connection to transition-ground level (left) and elevated (right) structural types. illustrations created by designer 2008



f 2.8c idea-tage concept generation connection to transition-ground level keyword *integrate* (left) and elevated keyword *provide* (right) structural types. images courtesy www.flickr.com. accessed and composited by designer december 2008



f 2.8d photomontage connection to transition-ground level (left) and elevated (right) structural types. photography by designer 2008



f 2.8e conceptual design connection to transition-ground level (left) and elevated (right) structural types. renderings created by designer 2009

Extrapolating the programmatic precedents, the following relationships are noted.

Programmatic precedents established potential existing and proposed technological advancements and tools for implementation of an interactive, intelligent environment. Each object's individual functional capability formed the basis for the S.R.A.M.E. Strategy conceptual framework.

#### **sense**

Spots offers digital media intervention capable of acting as both a projected surface and an embedded sensor.

Braincoat offers wearable media devices that can utilize collected information and transform into an initial response system. See *f 2.9a*.

#### **respond**

Loop Space introduces an organic shifting structural form capable of responding to changes based on event gathering, line formation, and user needs.

Civic Exchange introduces modular shifting structures capable of real-time interaction - both digital and physical - for space users. Media devices provide multi-scalar interaction - from close range information access points to long distance, wireless headlines. See *f 2.9b*.

#### **adapt**

Sim Shun River Thames Pavilion provides a similar extendable pattern that can function as an on-grade, elevated, or submerged landscape.

Tran/spot provides an extendable social kiosk outlet capable of physical and social change. The structure changes in response to external dynamics and adapts over time with emergent needs. See *f 2.9c*.

#### **mutate**

Ada: the living room and Hello Stranger suggests the possibilities of cognitive learning mechanisms and devices. While typical robotic technology is responsive to change, Ada and Hello Stranger are constructed spaces that think and interact at a complex human scale. See *f 2.9d*.

#### **emerge**

Fresh Kills acts as counterpoint to the digital technological focus of intelligence. As opposed to computerized intervention, Fresh Kills suggests that technology is not a function of the digital but can be the process of an evolving ecology.

The Blur Building displays intelligence evolving from on-site transformations and transitioning into influencing adjacencies. Blur is indicative of the potential in latent systems interacting with the exterior environment. See *f 2.9e*.

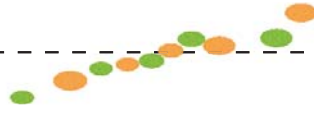




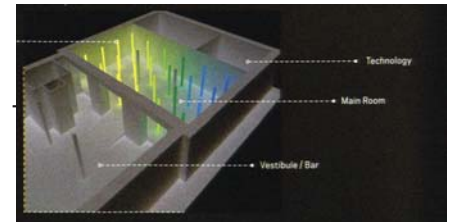
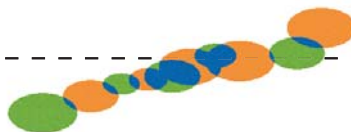
f 2.9a *sense* conceptual connection (center). illustration by designer 2009. *spots* (left). image source bullivant 2007, 4d social. *braincoat* (right). image source diller 2002.



f 2.9b *respond* conceptual connection (center). illustration by designer 2009. *loop space* (left). image source liu 2007. *civic exchange* (right). image source bullivant 2007.



f 2.9c *adapt* conceptual connection (center). illustration by designer 2009. *sim shun river thames pavilion* (left) image source liu 2007. image source diller 2002. *tran/spot* (right). rendering by howard mack, hok chicago intern team 2008.



f 2.9d *mutate* conceptual connection (center). illustration by designer 2009. *ada: the living room* (left). image source hwang 2006. *hello stranger* (right). image source hwang 2006.



f 2.9a *emerge* conceptual connection (center). illustration by designer 2009. *the blur building* (left). image source diller 2002. *fresh kills lifescape park* (right). image source schaffer 2002.



**S**ENSE **R**ESPOND **A**DAPT **M**UTATE **E**MERGE







f 2.10a location plan for site six, the bridge. illustration created by designer 2009

0' 375' 750' 1500' 3000'  
1:1500



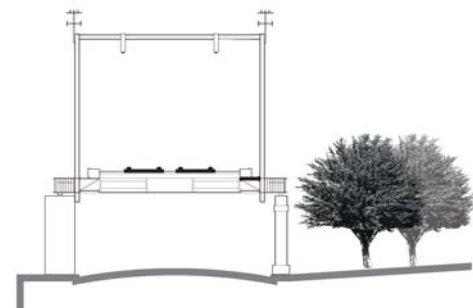
f 2.10b axonometric detail for site six, the bridge. illustration created by designer





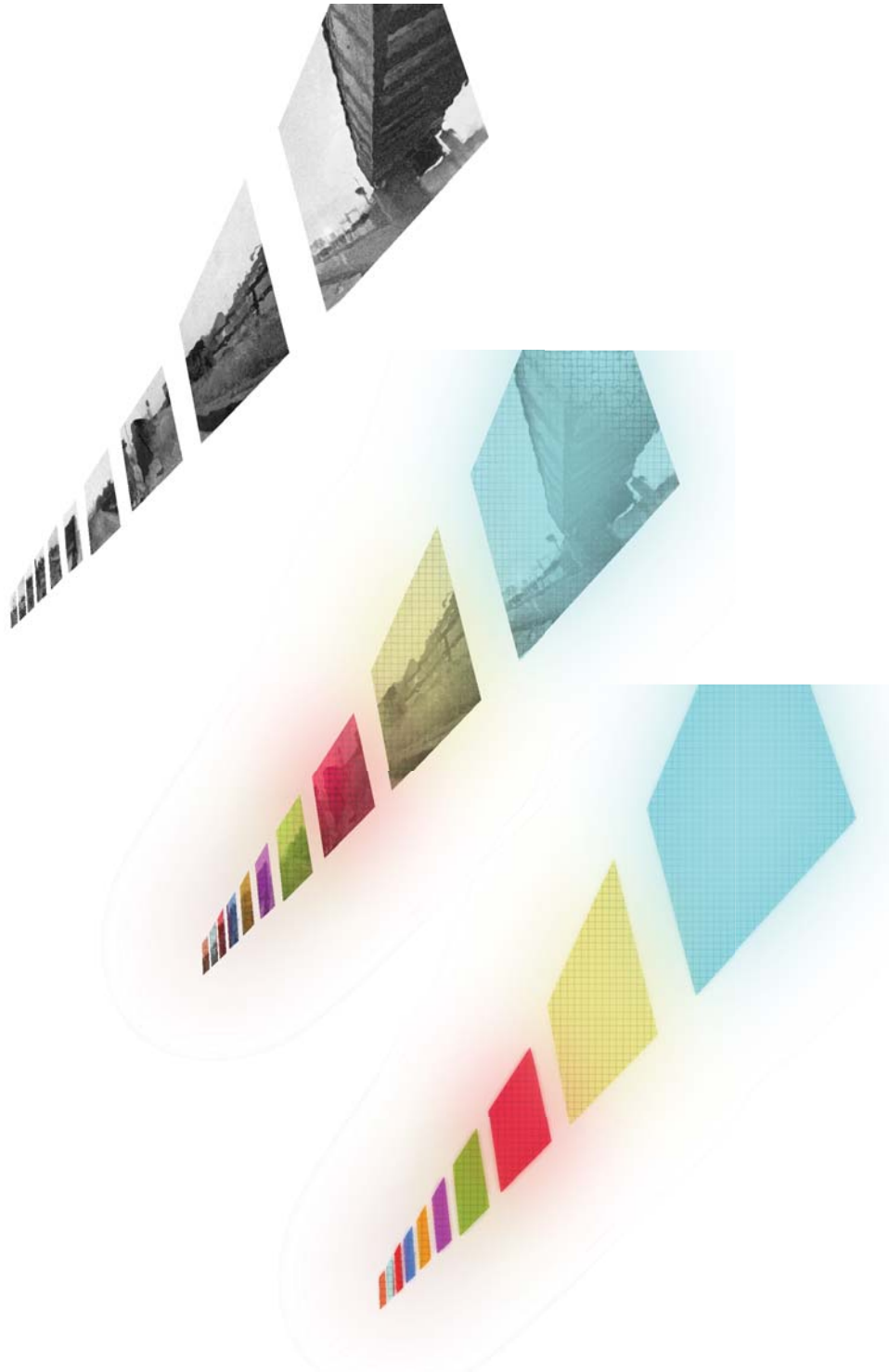
f 2.10c potential future plan for site six, *the bridge*. diagrammatic representation. illustration created by designer 2009

0' 375' 750' 1500' 3000'  
1:1500

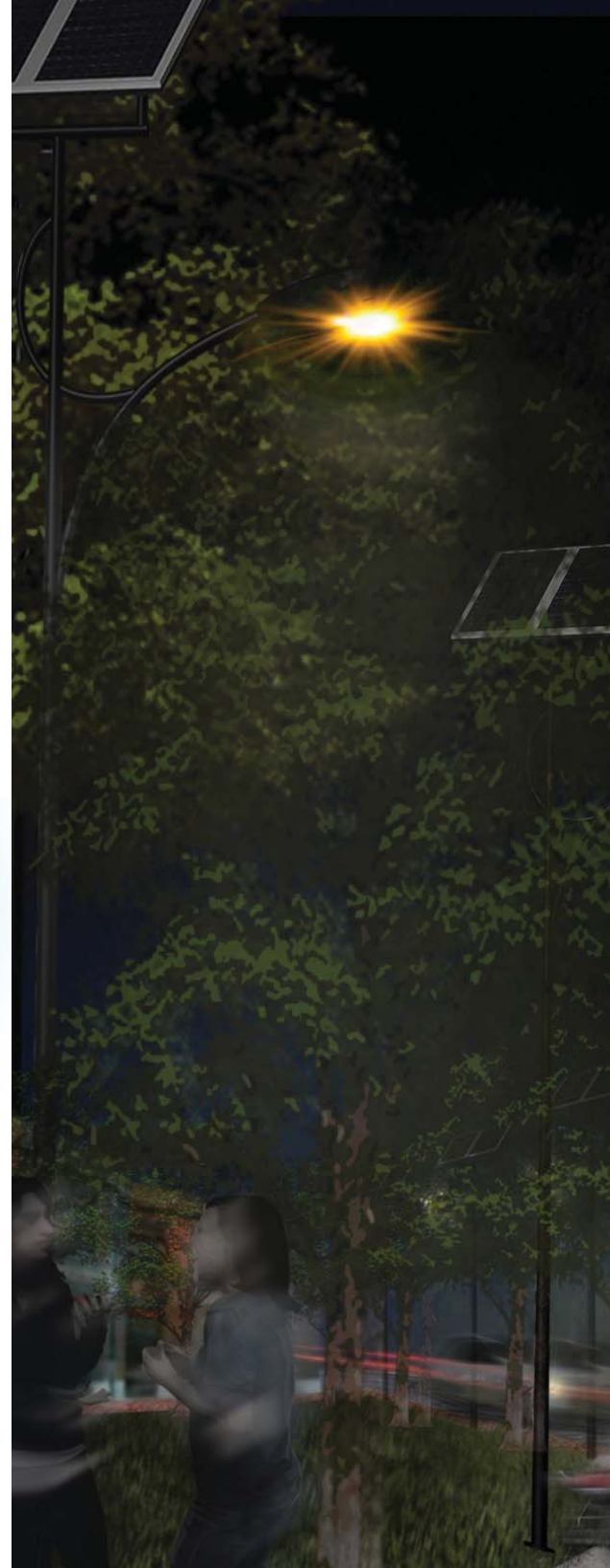


f 2.10d visualizing typical sections through site six, *the bridge*. illustration created by designer 2009

0' 375' 750' 1500' 3000'  
1:1500



f2.11a sense media wall mechanism. rendering composited by designer 2009









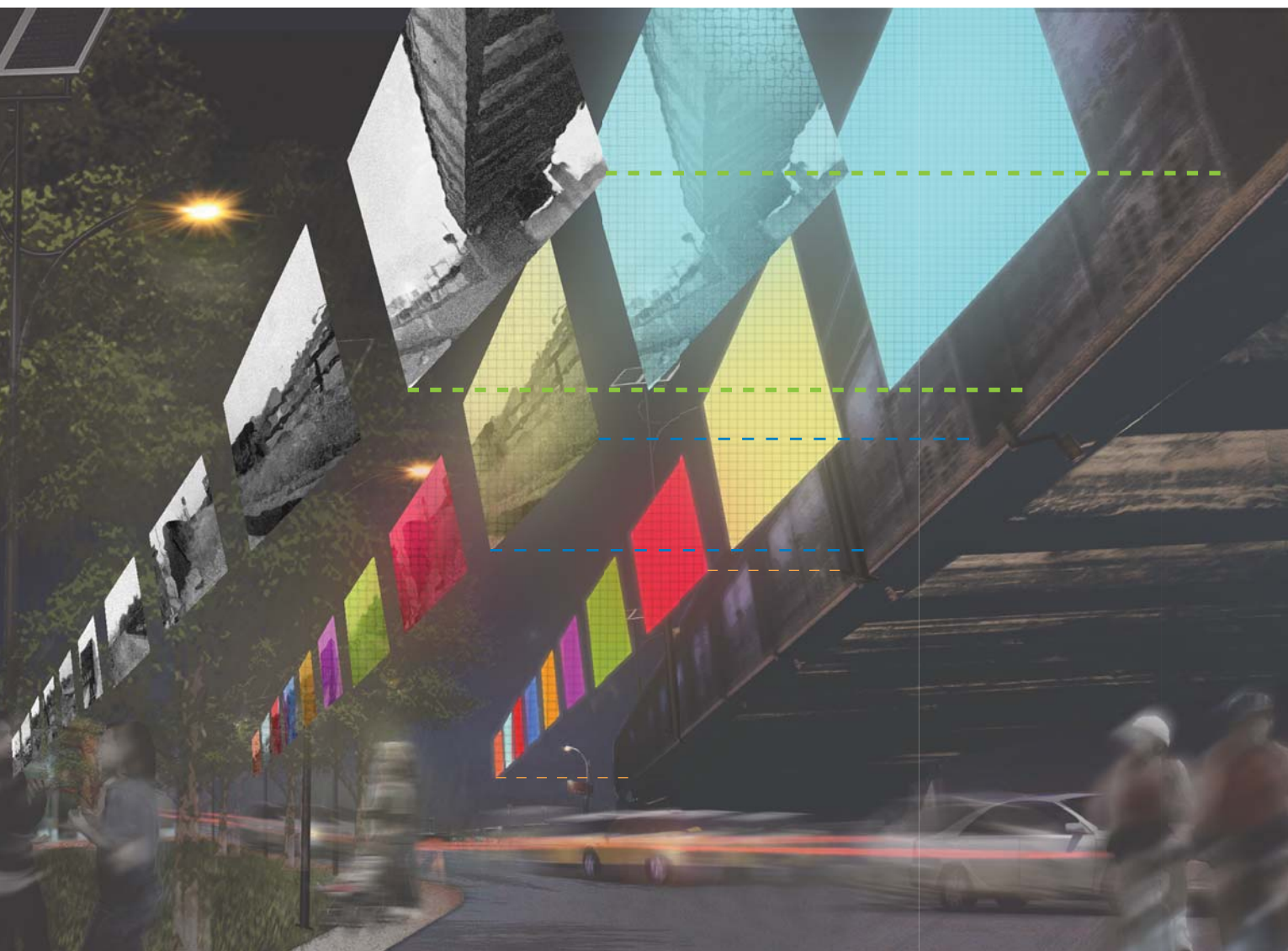
f 2.11b facing northwest underneath bridge overpass. photography by designer 2009

The S.R.A.M.E. Strategy first applies *sense* by embedding the bridge overpass with sensory mechanisms. See f 2.11a, b, c. Represented as a digital media wall integrating the existing steel structure with the device, the media wall computer-controlled LEDs is self-sufficient and powered through solar capture cells. Composed of perforated photovoltaics and similar to the GreenPix Zero Energy Media Wall, the media wall educates visitors on the possibilities of implementing ecologically sustainable efficient devices to enhance existing infrastructure and serves multiple purpose including but not limited to entertainment, social awareness board, advertisement, commercial distribution, surveillance. See f 2.11d.

The interstate and primary circulation routes intersect the bridge, and thus validate the location of the sensory media along the bridge's vertical elevation. As the Trestle's line begins to increase in use, the media wall could provide funding through advertisements, enable large-scale visual access for local art, assist in tracking and surveillance procedures, or serve as a motion-sensor entertainment device enjoyed by citizens, tourists, and visitors.



f 2.11c sense location axonometric. illustration by designer 2009



f2.11d proposed media wall extrapolation indicating options for LED colored lights, film entertainment, or surveillance mechanisms. rendering composited by designer 2009



## spots

Built in 2005, owned by Realities: United, and located along the highly trafficked Potsdamer Platz in Berlin, Germany on the Park Kolonnaden building, commercial developer-style architecture is transformed into public art. Constructed for use until February 2006 and commissioned by ad agency Café Palermo Pubblicità for HVB Immobilien AG, the integrated light and media installation used commonly available circular and cylindrical lights with approximately 70 watts of luminous output for the creation of animated patterns along building facades. The building façade featured work by Jim Campbell, Rafael Lozano-Hemmer, Carsten Nicolai, and John Dekron, curated by Andreas Broeckmann.

Can flexible, big-screen technologies serve a purpose other than commercial growth, similar to Time Square's media-infiltrated network? Can media walls serve educational, social, and economical processes simultaneously? Can, like Marisa Yiu and Eric Schuldenfrei's Manhattan, New York 2006 street faced-based installation Chinatown WORK (Bullivant 2007, 15), new media walls create a revived definition of a sense of place?

Contextually, Potsdamer Platz offers a varied landscape, having been destroyed during World War II and then divided by the Berlin Wall. Today the plaza boasts numerous new developments and continued interest since the tearing of the Berlin Wall in 1989.

While media walls are not a new invention, their introduction as a non-invasive 'skin' suggests possibilities of education, visibility, low-economic implications. Can public art be a part of successful design solutions? See f 2.12a, b, c, d.



f 2.12a building display. image source bullivant 2007 (4d social).



f 2.12b building facade and plaza connection. image source bullivant 2007 (4d social).



f 2.12c led lights located along building facade. image source bullivant 2007 (4d social).



f 2.12d building facade display and plaza connection. image source bullivant 2007 (4d social).

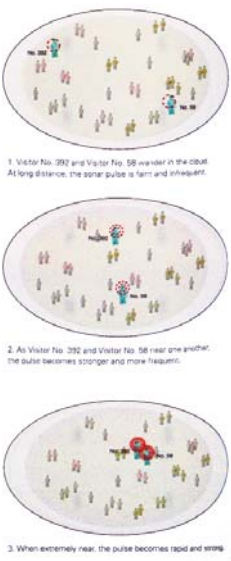


**braincoat**

Proposed for Diller Scofidio’s Blur Building for the 2002 Swiss Expo in Switzerland, *braincoats* are wearable technology that “submit control” to the user. The initial stage is programmed, and users receive surveys and a ‘color’ indicative of an emotion is associated with the results. Future use of the device is not programmed as the resultant gathering randomizes based on user input. The system requires users to initiate and changes in response to sensory elements and synthesized data. Braincoat offers the opportunity to integrate embedded sensors within a design site. Initial inquiry surveys and acquired site data gathered over time, when synthesized, can lead to richly layered and unknown design formulations. See f 2.13a, b, c, d, e.



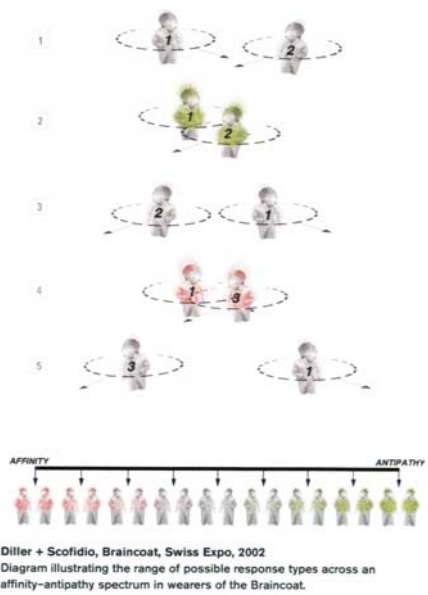
f 2.13a braincoat rendering. image source diller 2002



f 2.13b pattern simulation for changes in braincoat data assimilation. image source diller 2002



f 2.13d braincoat rendering. image source diller 2002



f 2.13c diagram illustrating the range of possible response types across an affinity-antipathy spectrum in wearers of the braincoat. image source diller 2002



f 2.13e illustration of devices embedded with braincoat. image source diller 2002







The S.R.A.M.E. Strategy next applies *respond* by providing public users with multiple forms of control. See f 2.14 a, b, c. Whether similar to the pocket-size of the iPod or the large-scale implementation of permanent digital media devices, the intent focuses primarily on providing a level of interactivity previously unavailable to the design of public open space.

Imagine if our designs were not dormant, static structures implemented for single purposes. What if designs could come alive? What if they become responsive and are able to evolve over time? Can users take an active part in the development of their environment especially since the environment being created is typically not that of the designer? See f 2.14 d, e, f.

What does the term 'public' connote in contemporary open space planning? What if, instead of focusing design on preconceived notions of 'landscape' or 'natural', designs could be a public participatory process, as it should be?



f 2.14b facing northwest along bridge.  
photography by designer 2008



f 2.14c *respond* location axonometric. illustration by designer 2009





f 2.14d *respond* handheld mechanism. rendering composited by designer 2009



f 2.14e *respond* handheld mechanism and structural control. rendering composited by designer 2009



f 2.14f *respond* handheld mechanism and media control. rendering composited by designer 2009

## loop space

Proposed for the 2012 Olympics, London and owned by Base 4, the Olympic promotional pavilion competition brief called for an external venue for the experience of the games in Trafalgar Square, London. Base 4 integrated initial research in self-organization and non-linear systems (through film manipulation) to create an interactive environment where input, output, sensors, and interfaces let users control their surroundings. Through a cross section of heavy traffic arteries, congested pedestrians at rate of approximately 4000/hour, three programming themes – crowd congregation, innovative projection techniques, and a dynamic continuous structure adaptable to any environment – emerged.

“Emerging from the collective behavior of each one of its component rather than as a certain expected aesthetical outcome...a constant feedback loop” (2007, 125), Liu asserts the creation of a sense of place as opposed to the establishment of a place, where user interactivity through responsiveness contributes to the form. “By combining together the social aspect of crowd congregation, innovative projection techniques and a dynamic continuous structure the pavilion is able to create a convincing architectural solution which could be adapted to any urban environment (Liu 2007, 129)

With the “conscious proposal of creating a third person space with the experiential quality of being immersed within the live event” (Liu 2007, 126) Loop Space was conceptualized as a tool that exhibited properties of self-organization. The transformation of film produces different reactions each time with continuous new iterations. The collective intelligence continuously adapts to changing boundaries as a dynamic equilibrium results (Liu 2007, 129). Dynamic, mutable, flexible; Loop Space offers an abundance of programmatic function. See f 2.15 a, b, c, d, e.



f 2.15a crowd image gathered in proposed loop space. image source liu 2007



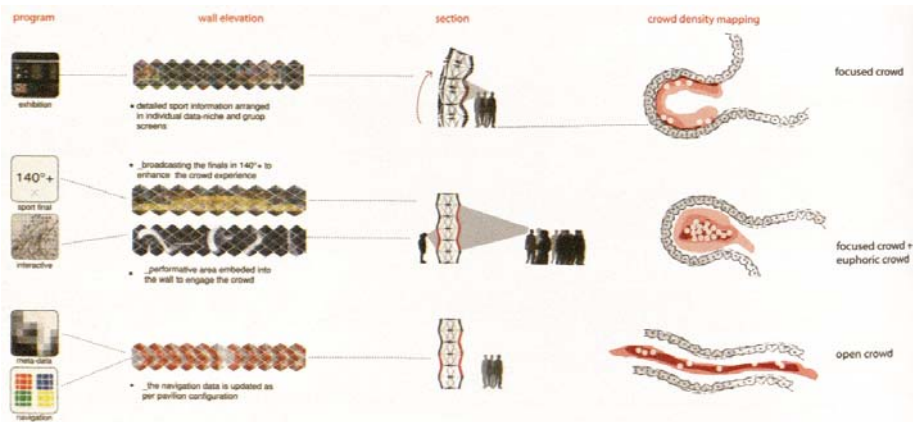
f 2.15d model of prototypical loop space. image source liu 2007



f 2.15b comparison of old and new path. image source liu 2007



f 2.15c rendering of visualizing use of media devices within loop space. image source liu 2007



f 2.15e program, elevation, section, and crowd mapping diagrammatic analysis. image source liu 2007



## civic exchange

Proposed for Lower Manhattan in a 2004 competition by Masmichi Udagawa and Sigi Moeslinger of Antenna Design, the site is theoretically located in Battery Park City. Surrounded by multiple land uses catering to a live, work, and visit atmosphere within New York and with few existing digital interactive functional spaces, Civic Exchange proposes to stimulate place-based education. Bullivant notes that “as digital information systems are increasingly structuring society, reinforcing an urban sense of place by physical means is now often insufficient” (Bullivant 2007, 23) as Antenna Design’s multi-disciplinary, digital system creation, public involvement “enlarge each individual’s sense of cultural context” (Bullivant 2007, 23). Easy access to local information, public space location and interaction points, and open-program in the modular structure provided a successful social convergence point.

A hub and spoke concept, with open, modularly-additive platform allows for seating, visual access, interactive mapping, community information point (‘hot spot’), and a social awareness center. Small-scale structures that are interactive, modular, responsive, and adaptive can serve as catalysts for development. Within St. Louis, these ‘devices’ could be the ‘embedded sensors’ providing large or small-scale interventions and opportunities for engagement. They serve Lynch’s suggestion of ‘landmark’ (Bullivant 2007, 22), have easy plug-and-play opportunities, and would only require maintenance to ensure success. These kiosks could proliferate throughout the city serving as a branding agent or identifying node. See f 2.16 a, b, c, d, e.



f 2.16a using civic exchange: modular and accessible. image source bullivant 2007



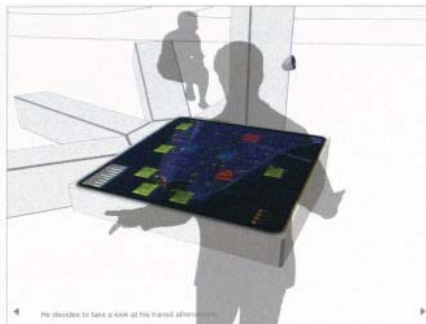
f 2.16b accessible interactive screen. image source bullivant 2007



f 2.16c capability of kiosk to change, adapt, mutate. image source bullivant 2007



f 2.16d visualization of kiosk use: note the multiple uses including seating, accessible screens, scrolling banners. image source bullivant 2007



f 2.16e overhead perspective detailing screen interface. image source bullivant 2007







The S.R.A.M.E. Strategy then applies *adapt* by extending physical structures from the existing Trestle line and integrating with the existing context. See f 2.17 a, b, c. On the bridge site, the Trestle extends a platform south towards a current warehouse-storage building. Adaptive reuse of the structure could potentially lead to a mixed-use building, residential condominiums, or community center. Instead of tearing down the existing structure, reusing the on-site materials and on-site renewable resources would lead to a sustainable pattern of construction. See f 2.17d.

A ramp system linking to ground level would enable pedestrians to move onto the Trestle line. Amphitheatre steps over site five, elevated rail over open space, provide vantage points to the east and north. Paving patterns illuminate based on user directed actions. Steel material areas on the Trestle are exposed and covered with transparent or translucent material. The Trestle line comes alive, responsive to changing user needs then acclimating its condition to reflect user directives. The emergent extensions connect existing and proposed creating a conceptual link of old and new; past, present, future; the blending of landscape, nature, artificial, and man-made into a single collective unit. See f 2.17e.



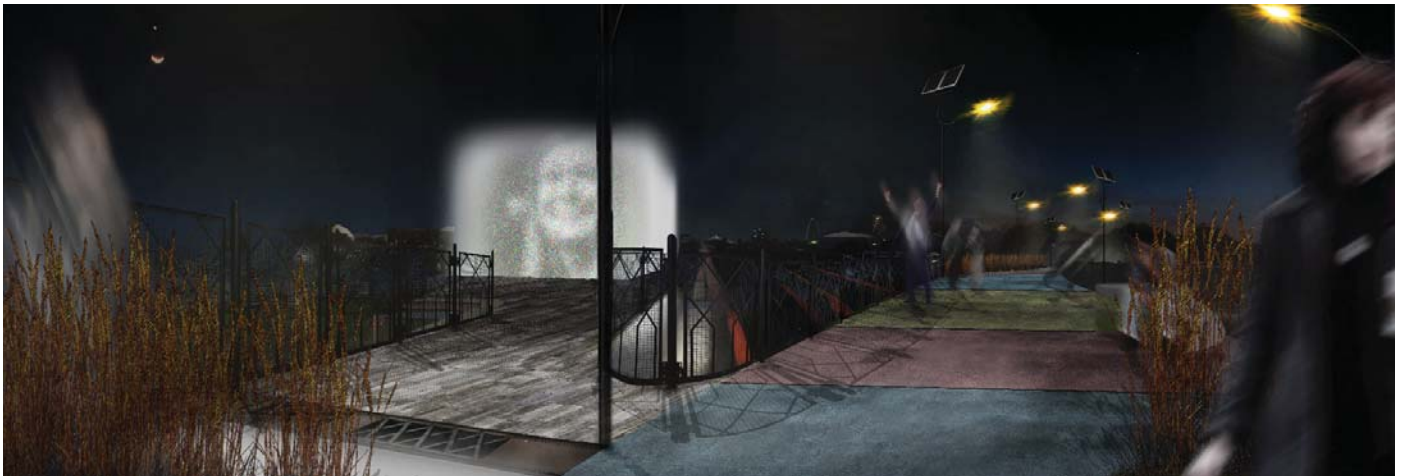
f 2.17b facing south to downtown along bridge. photography by designer 2008



f 2.17c adapt location axonometric. illustration by designer 2009



f 2.17d *adapt* montage sequence of initial Trestle condition with reconditioning. rendering composited by designer 2009



f 2.17e *adapt* montage sequence of extension system from existing Trestle line. rendering composited by designer 2009



## sim shun river thames pavilion

Located along the south bank of the River Thames in United Kingdom is the site for intending to fuse structural form with event based spaces. Proposed by 5 Subzero of Austria, the pavilion has the potential to be an evolving form transforming spaces based on unpredictable user behavior.

Due to its varied user demographics, tourist patterns, and the location of prominent structures including the Millennium Ferris Wheel and the House of Parliament, the South Bank is a busy pedestrian hub and primary Thames River entrance. Congested pedestrian routes can be mediated through the creation of a fluid, adaptive, interactive built environment with a program that fluctuates in accordance to queue formation; cloud-like three-dimensional fieldspace with volumetric density components of lightweight, kinetic, temporary particles as opposed to unrestrained pliant surfaces such as rubber or elastic; and potential for polymorphic structural transformations.

Display and ambient output of the component field services the user with media. Queues offer unique spatial interaction experiences; mechanical transformations move; displays are embedded; and knowledge accumulates. Stimuli code and organize the performances within the pavilion as "collective organization can emerge from the multiple user requests and interactions" (SimShun 2008).

Simple insertion and adaptability can lead to varieties of formal and spatio-temporal functions: "Each pavilion becomes an architectural landscape that defies the concept of architectural obsolescence by evolving in parallel and adapting to changing environmental and urban conditions" (Liu 2007, 157). See f 2.18 a, b, c, d, e.



f 2.18a the pavilion as seating. image source liu 2007



f 2.18d layered transforming skin. image source liu 2007



f 2.18b extended skin along night walk. image source liu 2007



f 2.18c extending to the riverfront. image source liu 2007



f 2.18e site visualization of the fully extended skin located within river thames context. image source liu 2007

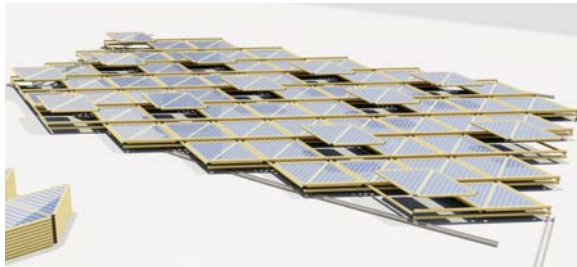


## tran/spot

Proposed to proliferate throughout Chicago within quarter-mile proximity of mass transportation routes, Tran/spot is a modular, self-sustaining educational social kiosk structure that transforms with the needs of its users. Completed by a multi-disciplinary intern team, the kiosk is publicly funded, tended by citizens, and an identity marker for communities. Easily assembled as well as disassembled, the recycled material and steel structure can bend and change, and the structure allows for the option to add self-sustaining photovoltaic panels.

The structure is designed to become a community space such as a future public park, and if necessary, can be easily disassembled or moved. Specific construction changes with each unique contextual assembly as the resulting public spaces become indices of the building's occupation and its dialogue with the neighborhood. The program includes a double-sided media wall, open gathering area, Wi-Fi zone, and educational-employment outlet.

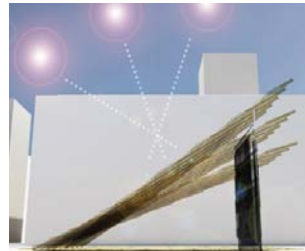
The modular, flexible, diamond-esque structure holds possibilities for community development, temporary events, and social serving mechanism applicable to the Trestle. The structure reduces the carbon footprint, provides real-time information to the local residents, and in time, has the flexibility to truly adapt and educate. The solution is not necessarily for prototypical building forms but more so for creating modular accessible informational public spaces. It is "sustainability," but in a different form. As communities engage with Tran/spot's construction, occupation, disassembly, and memory, they will discover innovative techniques for locally addressing the social and ecological challenges. See f 2.19 a, b, c, d, e.



f 2.19a structure of tran/spot at fully closed position with pv panels separated. rendering by howard mack, hok chicago intern team 2008



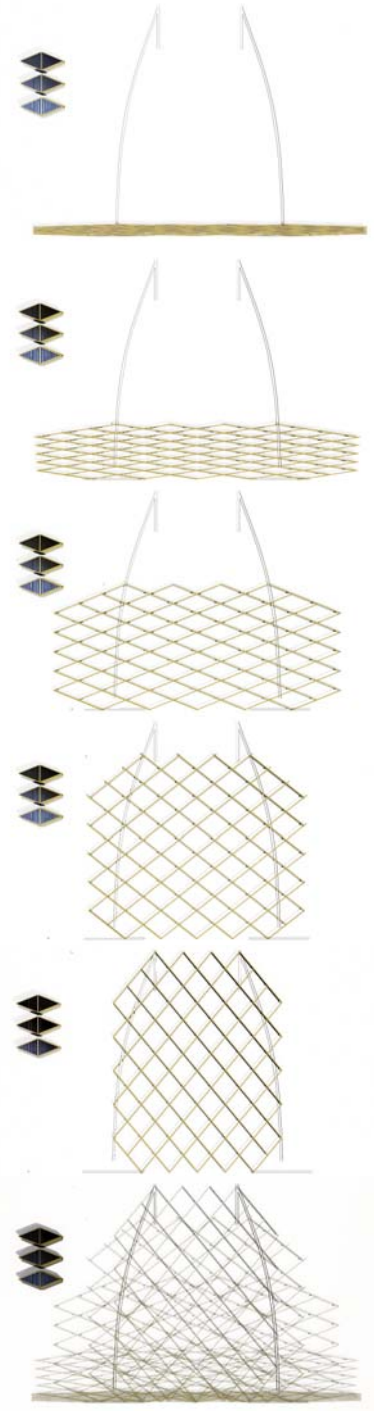
f 2.19c modular structure set within site context: urban infill brownfield site on western stop off the blue line in chicago. rendering by hok chicago intern team 2008



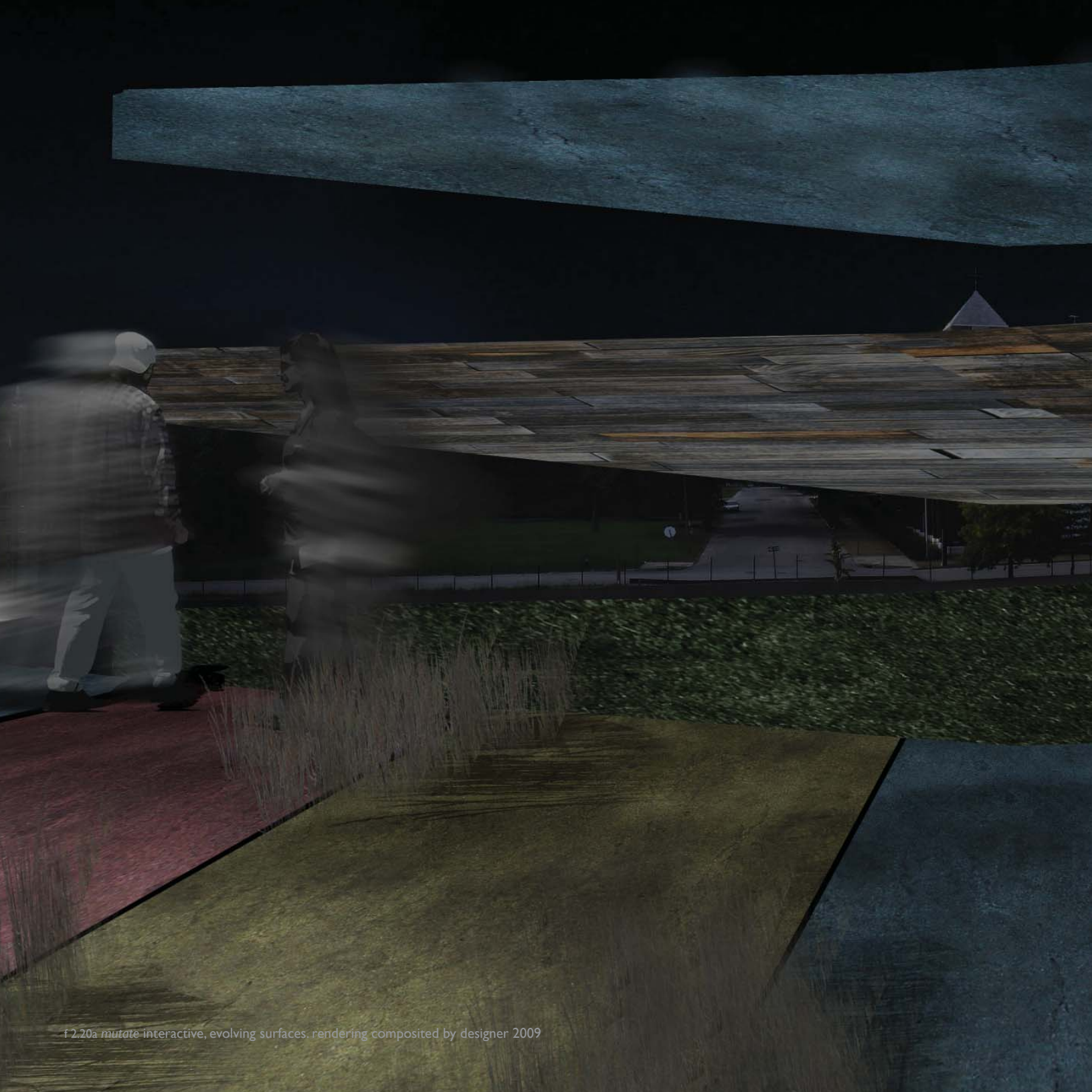
f 2.19b sectional transformation. rendering by howard mack, hok chicago intern team 2008



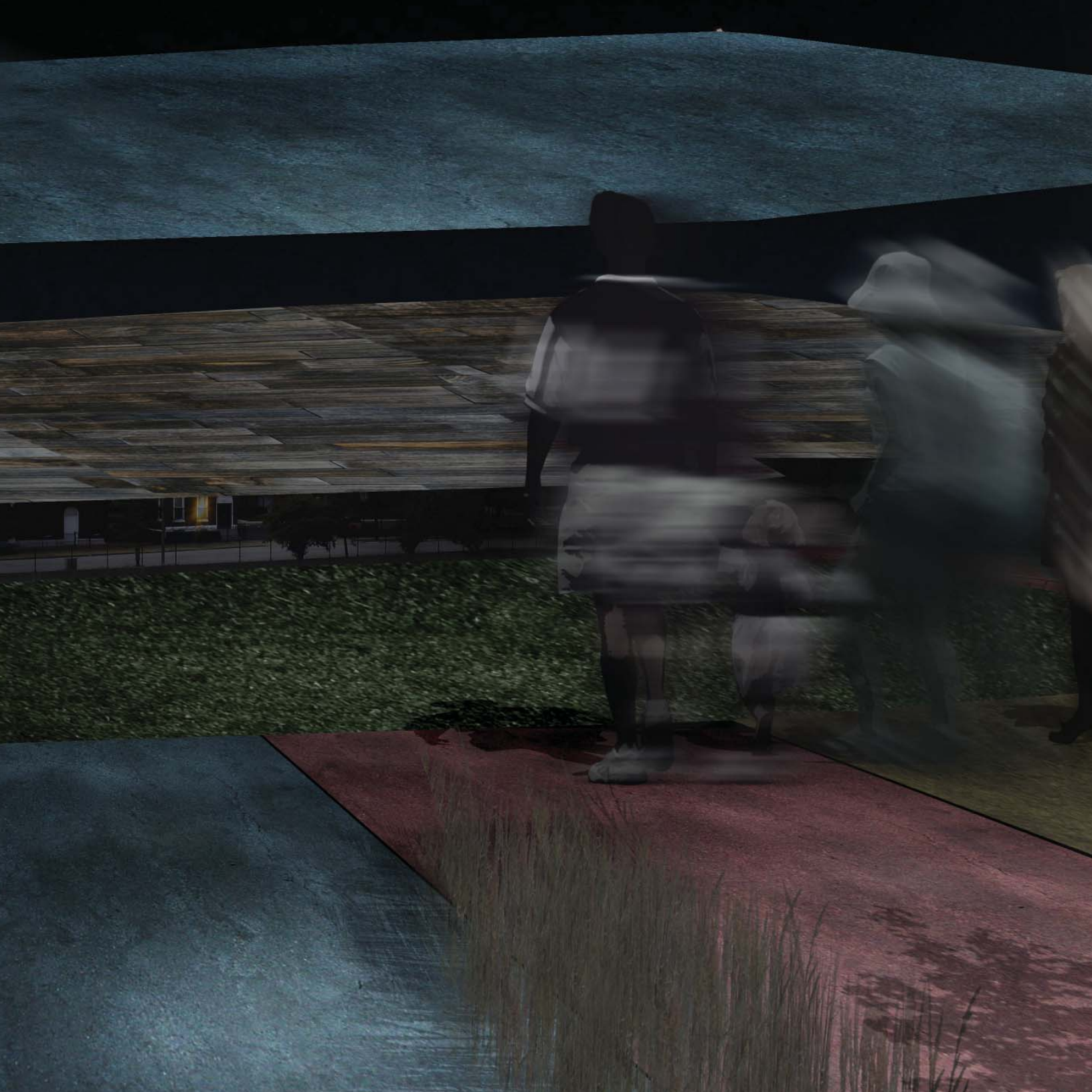
f 2.19d proposed three-step proliferation of kiosk through chicago. illustration by shaney gomez, hok chicago intern team 2008



f 2.19e phasing of structural changes. rendering by howard mack, hok chicago intern team 2008







The S.R.A.M.E. Strategy then applies *mutate* by taking the embedded sensory devices, responsive mechanisms, and adaptive physical structures, and integrating into a thinking network. See f 2.20 a, b, c. The *mutate* state enables and is enabled by the embedded devices. As continued collection of data increases, information changes are processed through the network.

Initiatives conducted on the Trestle include the change within paving patterns. As use increases on one portion, can another area be revealed as a potential destination point? If the Trestle 'comes alive', can the information relay patterns of use and disuse? Can the sensory devices collect the data and transform the material into usable information? See f 2.20d.

The primary method for the evolution of the mutative state is the physical extension of the open space link from the elevated Trestle portion onto the ground plane, and specifically, covering the interstate. Spanning southwest from the Madison Street overpass to the beginning of the on-and-off ramps from the interstate onto 10th street, the covered highway would serve as a catalyst destination point. Multiple programmed and undeterminable programs can emerge as users determine the specific needs of the space. The covered highway creates the necessary physical and visual link from the industrial district on the east and the typical residential neighborhoods on the west. See f 2.20 e, f.



f 2.20b facing west to north st. louis neighborhoods. photography by designer 2008

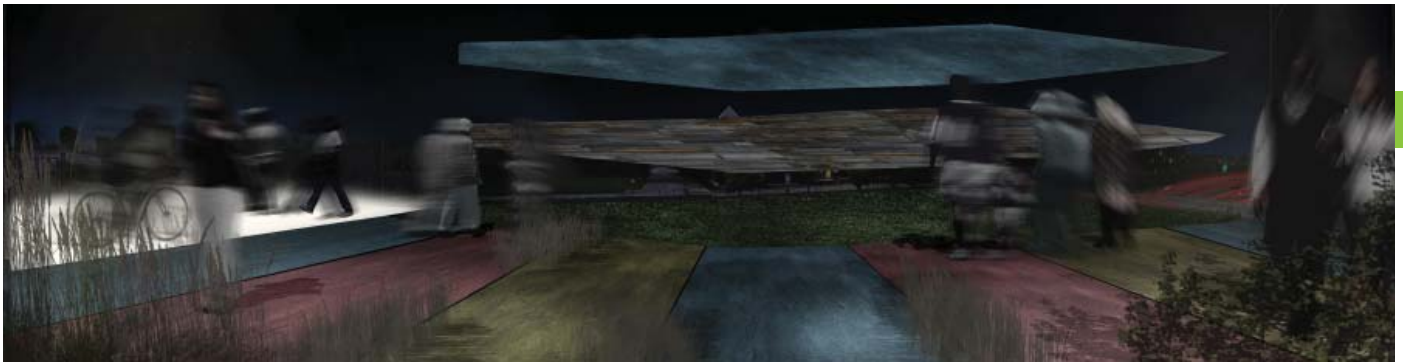


f 2.20c *mutate* location axonometric. illustration by designer 2009

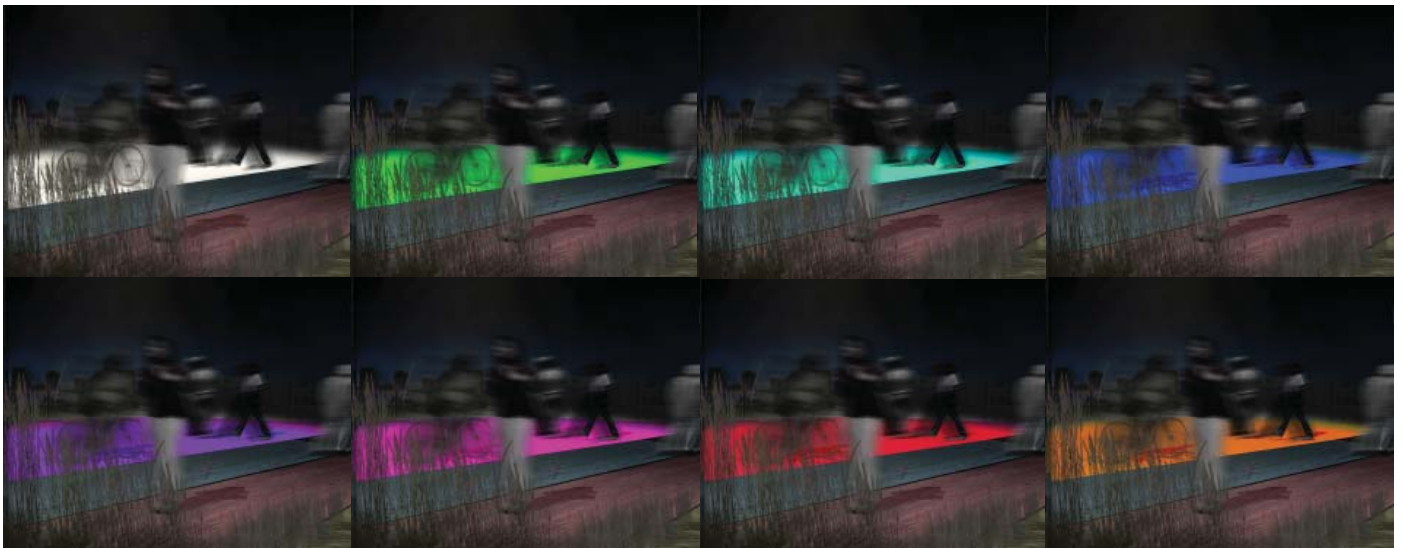




f 2.20d highway visible from elevated Trestle. rendering composited by designer 2009



f 2.20e three proposed structural coverings: concrete-granite (permanent), wood (semi-permanent), vegetation (temporary). rendering composited by designer 2009



f 2.20f transforming translucent covering exposing steel below Trestle. rendering composited by designer 2009

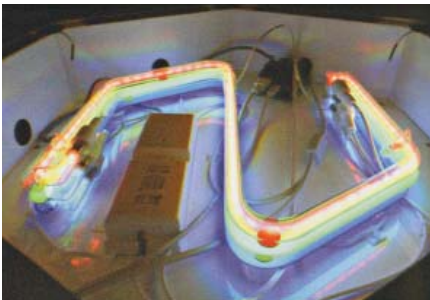
## ada: the living room

An interactive exhibit designed for Swiss Expo 2002, Switzerland National Exhibition in Neuchatel, Switzerland, the multidisciplinary led by psychologist Paul Verschure of the Institute of Neuroinformatics, University ETH in Zurich, Switzerland created Ada, a thinking, sensing, and interacting space. Ada “explored the relation between human and digital behaviors, and their mutual capacities to affect each other” (Hwang 2006, 172).

A generator of complex movements and flows that could be harnessed and guided, Ada is an open artificial system located within a sequenced arrangement of spaces and experiences that varied dependent on reactivity to and from Ada. Defining high level behavioral integration and time-varying adaptive functionality, Ada is dependent on real-time interactions.

“The four basic behavioral functions Ada incorporates – tracking, identifying, grouping and playing with visitors – represent a set of interconnected, interdependent, simultaneously evolving internal processes” (Bullivant 2005, 89). Upgrades, integration, and continued human presence stimulates ‘cognitive development’ in the machine. Ada’s program influenced the behavior of visitors. Visitor attitudes could be predicted by behavior to Ada validated through as surveys suggesting Ada’s view as ‘creature,’ not just machine (Bullivant 2005).

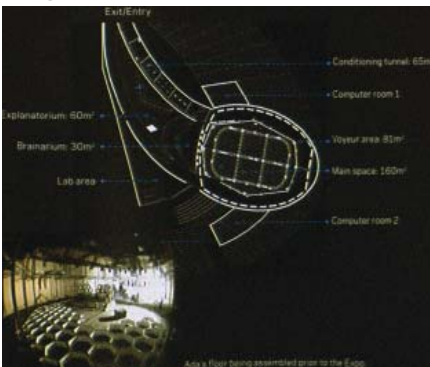
An introduced simulated neural network, agent-based systems, and conventional human relatable procedural software can provide an immersive environment that may signal the most realistic (not human but reaching a cognitive level) version of an intelligent adaptive environment. Ada’s creators, with the creation of real time coherency, understandable features, and a rich range of intelligence that can be upgraded – much like humans – suggest the possibilities in implementing a similar system embedded within the Trestle. See f 2.21 a, b, c, d, e.



f 2.21a led light with sensory mechanisms. image source Hwang 2006



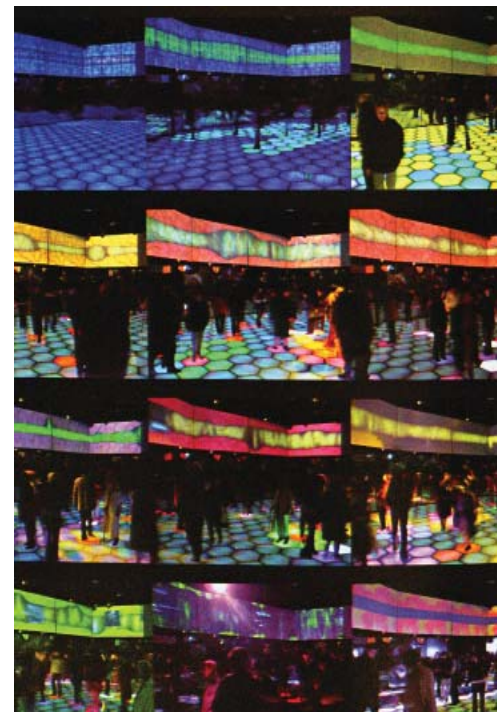
f 2.21b entry sequence. image source bullivant 2005



f 2.21c diagrammatic space layout. image source hwang 2006



f 2.21d light panel detail. image source bullivant 2005



f 2.21e multiple visualizations of space use with changing light patterns. image source hwang 2006



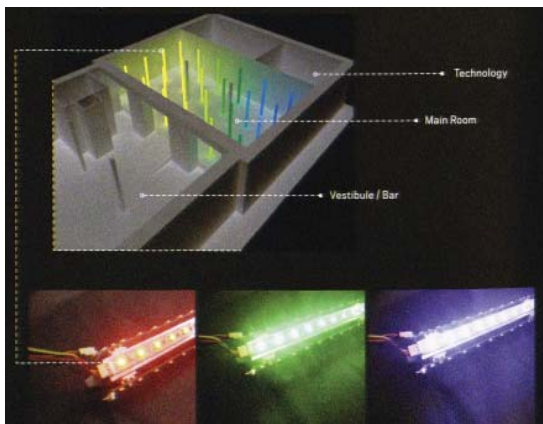
## hello stranger

Created for the *Science et Cite Zurich 2005* and *Brainfair 2005* by Vehovar and Jauslin Architektur, lighting designer Rolf Derrer, Institute for Neuroinformatics and the University ETH Zurich - the same team for the Ada project - addresses how “architecture and objects can resemble and behave like living organisms, adapting to their users’ changing needs” (Hwang 2006, 177).

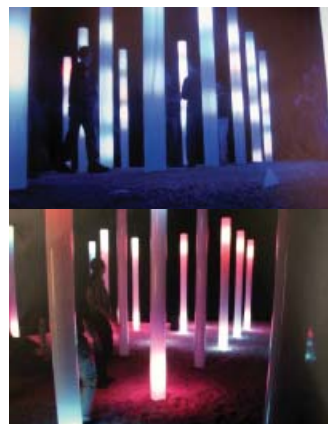
Located within an enclosed rectangular space, Hello Stranger is a dictated bounded sequence with interactive sensory light devices capable of changing moods in relation to real-time interaction with visitors. In order to provide a “truly interactive piece, and not a purely reactive installation” (Hwang 2006, 177), Hello Stranger first advertises its presence by lighting up a stele. Visitors can choose to stay or follow; with increased interaction, Hello Stranger reacts in turn, strengthening the contact, and intensifying the amount of light emitted. The reactions to stimuli by Hello Stranger are unknown as behavior occurs after the recording of the experience and adaptation. The lights and music provide suggestions for visitors as they make decisions. Positive or negative reactions may ensue, a feature based upon how the human reacts in space.

Hello Stranger elements include adaptive buildings that can exchange knowledge, react to external stimuli, interpret the data, makes conclusions, and can adjust; a protocol system implemented through a neural network based on natural nervous systems; a sensory system (Hello Stranger can feel emotions, moods, and feelings including surprise, pleasure, sadness); non-linear direction comprised of series of experiences; 30 translucent light pillars and the Roboser artificial sound composition system; and a neuronal simulation environment with “large-multilevel neuronal network [that] allows these simulations to interact with ‘real-world’ equipment” (Hwang 2006, 179), similar to robotic intelligence.

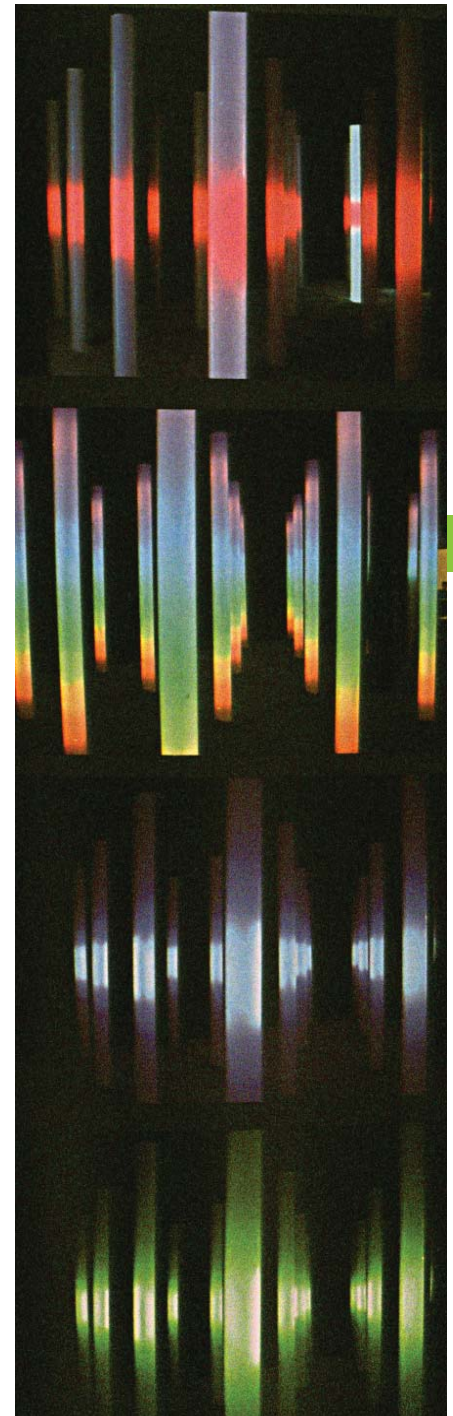
“In reacting to our movements and desires, the architecture itself takes on a personality, becoming a body in itself: a potentially superior method of processing and responding to our needs in the built environment” (Hwang 2006, 177). Hello Stranger furthers the notions of Ada, using not just incremental learning and growth to adapt but also adapting in real-time with visitors in both positive and negative manners. “Adaptation to site conditions, communication, cross-linking with other systems and the ability to learn...all this means that architecture and objects will share the characteristics of an organism” (Hwang 2006, 179). See f 2.22 a, b, c.



f 2.22a diagrammatic location aerial. image source hwang 2006



f 2.22b lighted steles interacting with space users. image source hwang 2006



f 2.22c hello stranger reacting to external stimuli. image source hwang 2006







The S.R.A.M.E. Strategy lastly applies *emerge* by combining the real-time direct relationships established on the Trestle line and influencing the adjacent developments. See f 2.23 a, b, c. The first four methods (sense, respond, adapt, mutate) focused on immediate physical, structural, or technological changes.

An emergent system transforms the initial stages and indirectly impacts the two surrounding sites - the transition into the wooded area on the west and the open space industrial portion on the east. The functional capabilities of the line, including access, safety and security, and lighting, merge with the proposed intelligent system. Use or disuse determines maintenance and change. Programmed activities and events can give way to unprogrammed and undeterminable emergencies. Seasonal changes begin to have an influence on the structure of the Trestle and the open space design.

The emergent system's power is not in the on-site adaptations and transformations nor in the technological sensing and thinking embedded devices. An emergent system first takes the lessons (data) gained from the individual site; enhances directly on the site; and when successful, enables adjacent growth. Examples include the transformation of the current commercial-wooded area to the west into a residential live-work community utilizing the existing on-site shipping containers as residential housing. The open space link to the west lies dormant, but, with the enhancement of the Trestle line above, can transform into a multi-use, multi-function connective link between the residential neighborhoods and industrial quarter. See f 2.23 d, e, f, g.



f 2.23b facing south to bridge over interstate.  
photography by designer 2008

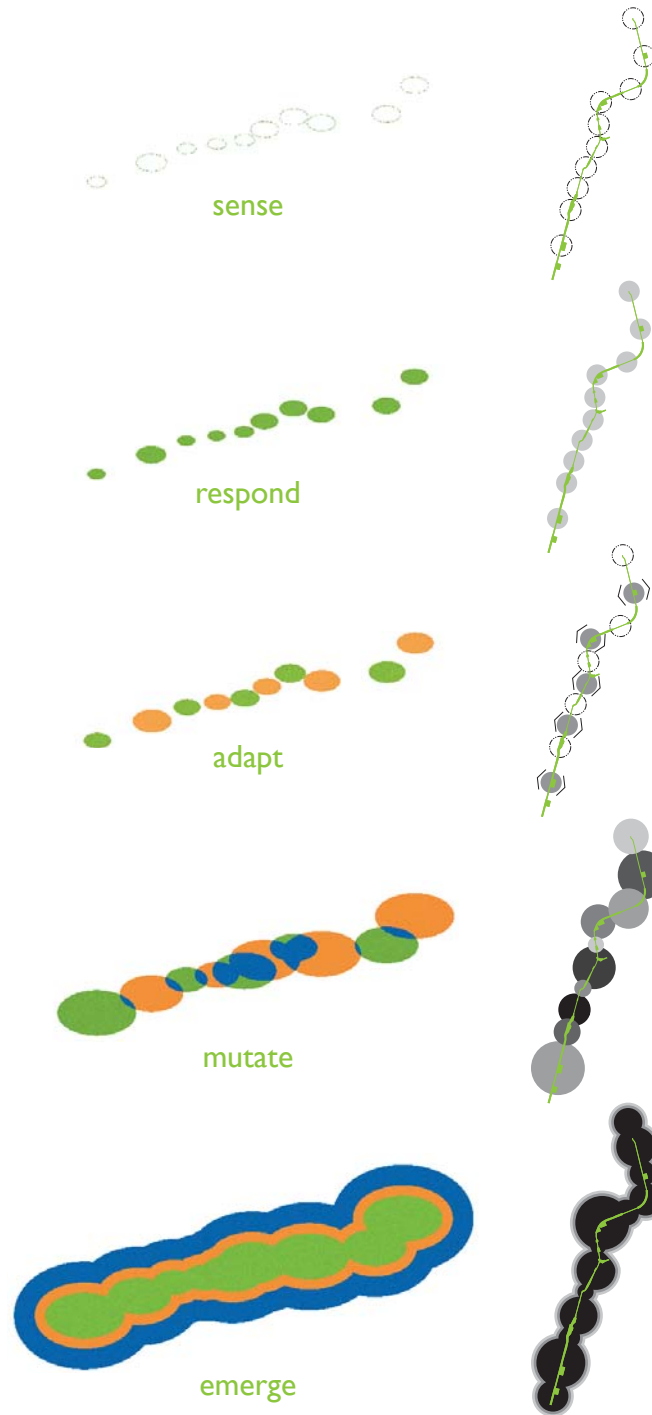


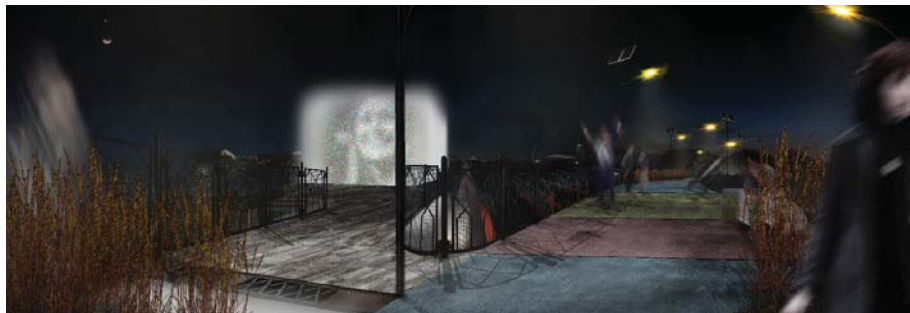
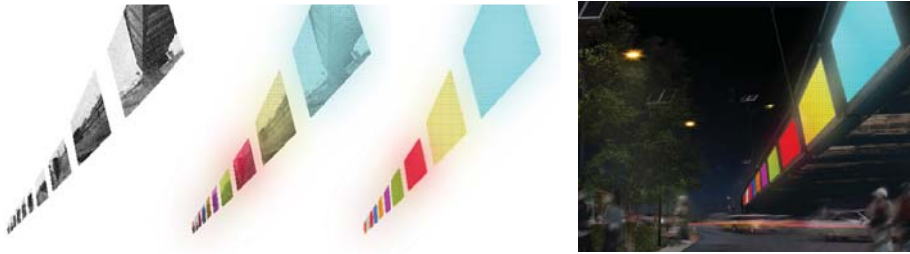
f 2.23c *emerge* location axonometric. illustration by designer 2009





**s.r.a.m.e. [emergent connective link]**





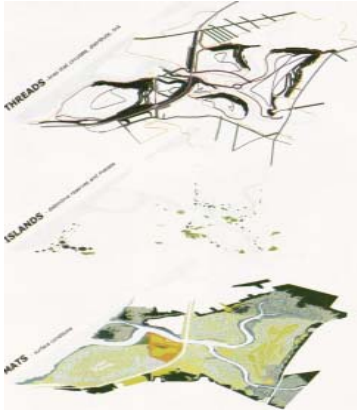
## fresh kills lifescape park

Proposed as a converted brownfield in Staten Island and designed by Field Operations and the city of New York, Fresh Kills Lifescape Park explores an emergent ecology and its development over time. Homogenous and alien ecologies currently exist on the site. Located over 2200 acres, the former site of industrial wasteland, with landfill loads comparable to waste mounds the size of mountain is to be converted into an unplanned yet programmed site. It is a “long-term strategy based on natural processes and plant life cycles to rehabilitate the severely degraded area” (Reed 2006, 156).

For fifty-three years, the waste accumulated on site to heights of 100-225 feet. The closing of the landfill in March 2001 now poses issues of sinking mounds, groundwater pollution, methane gas emission, and toxic soil, although it was opened following the September 11 World Trade Center destruction. The intent is to create a place as an expansion and network of greenways, recreational open spaces, and restored habitats in order to “form the heart of an expansive green matrix of infinite horizons and newly connected ecosystems” (Schafer 2002, 20). Approximately half of the site is composed of creeks, wetlands, and lowland areas.

There is a desire to incorporate wildlife, cultural, and social life; restoration of the marshes and forests; and introduction of new habitats and physical human based amenities. Program elements include nature, sports, festivals, walking, arts, education, preserves, and biking program. A matrix of linear pathway and elements or ‘threads’, surface articulation through fields or ‘mats’, and clustered grouping of ‘islands’ maximizing movement and access freedom, are to be introduced. Linear threads direct flow; clusters provide denser mats of expansive areas. Surfaces create a mosaic of ‘porous’ surfaces to stitch the mold together in order for “different ecosystems of the site [to be] physically and visibly legible as different meadows, plantings, habitats and programs” (Schafer 2002, 24). The intent is to build over four stages in thirty years as rehabilitation occurs with interior grasslands, edged dense plantings, and program within lowlands.

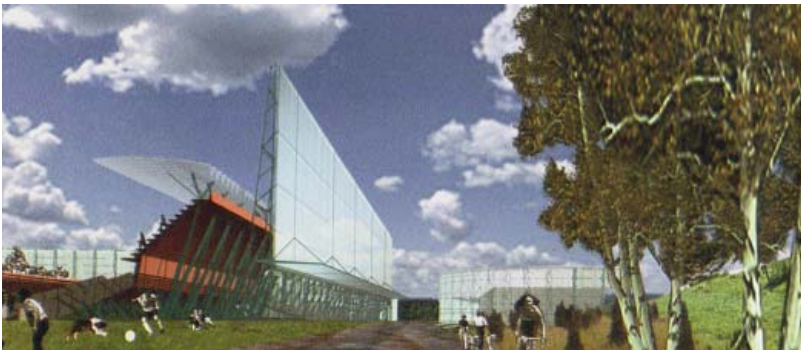
Lifescape maximizes interconnectivity. The potential of the unprogrammed yet highly dictated ‘landscape’ suggests that while people interaction is necessary for the creation of people centered spaces, there are some areas that will not be populated by people. If embedded sensors can detect, react, store, and adapt in a way that is reflective of human needs, natural ecological processes can be enhanced through natural ecological products. How a site integrates emergent forms of technology to create a cohesive, connective whole will be crucial in establishing the validity and success of an intelligent environment. See f 2.24 a, b, c, d.



f 2.24a threads islands mats: strategic approach to fresh kills. image source schaffer 2002



f 2.24b visualization of fresh kills landscape. image source schaffer 2002



f 2.24c site visualization of fresh kills emergent landscape. image source schaffer 2002



f 2.24d aerial perspective of fresh kills implemented strategy. image source schaffer 2002



## the blur building

An interactive, reactionary, emergent exhibition pavilion built and deconstructed for Swiss Expo 2002 on Lake Neuchatel in Yverdon-les-Bains, Switzerland built jointly by Diller Scofidio + Renfro and West 8, the designers created what they term “nothing” a “featureless, depthless, scaleless, spaceless, massless, surfaceless, and contextless” (Schafer 2003, 93). A pavilion without purpose, designed not as a utopian vision of the potentials in future technology but rather as a critique of the immediacy of the present.

Diller suggests that there is “nothing that dates faster than speculation about the future” (Schafer 2003, 101). Neither rejecting technology nor wholly accepting new innovations as quintessential ingredients for future success, the Blur Building focuses on an “optimism for inefficient technologies, not to project an idealized future, but instead to reconfigure a very real present” (Schafer 2003, 101).

The system operates when water is pumped, filtered, and shot as fine mist. The weather system reacts in an intelligent manner (though with an eight-minute delay). Visitor experience is not singular but built through daily exposure, changes, adaptations, mutations. The fog mass and smart weather system is affected by all stimuli. “Blur’s extreme mutability – changing with the hour as well as the slightest shift in wind” (Schafer 2003, 94) suggests the temporal shifting nature of adaptive intelligent systems. “They avoid the modernist correlation of form with hardware (technology as product) and the postmodernist correlation of form with software (technology as process)...they indicate an appropriate of technologies not for products and results, but for active, open-ended behaviors and functions” (Schafer 2003, 97).

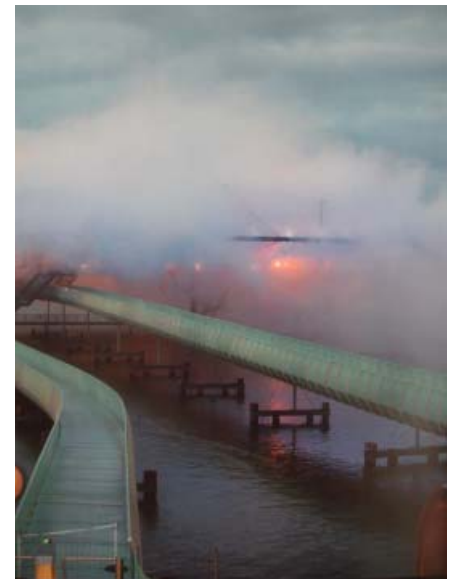
A guiding maxim for the Trestle project, Lifescapes propose whether or not it is possible to mediate the realm of technology in a hard traditional manner and a contemporary adaptation of technology to encompass all matters of design? As Diller suggests, “technologies are not design or fabrication tools, but instead are materials to be deployed...afford a means to an end...to inform design, to realize intention, and to create effects” (Schafer 2003, 97). The Blur building is intended to synthesize the mechanical and inefficient technological innovation that can lead to an adaptive process of growth. Mutation without control is chaos; prescription without change is boredom. Where does the line occur? What is the tie to the inherent ecology left to the unprogrammed, the Fresh Kills or Downsview Park? Can this inform intelligent environments and are these systems the potential? See f 2.25a, b, c.



f 2.25b time-sequence phases of the fog system reacting to weather changes. image source crandal 2003



f 2.25a visualizing the blur building along the foggy walk. image source crandal 2003



f 2.25c the bridge link visualized. image source crandal 2003



f 2.26 gateway entrance with sustainable urban agriculture bordering river edge and recreational front. rendering composited by designer 2009















s.r.a.m.e. [commercial rooftop]









# P H A S I N G



**three structural types**

Based on physical and hermeunetical observations, the Trestle's existing structure's threefold division enabled the identification of specific testing sites. Careful implementation of the entire strategy at one site suggests future relationships and connections can be established.

**ten sites**

Ten distinctly unique sites along one Trestle line have been identified as starting points for implementation. While not necessarily focused on immediate implementation, the success of one site is contingent upon the relationship established with the neighboring site.

**the bridge**

The bridge's central location led to its selection as the prototypical testing site. with successful display of the potential impact of the S.R.A.M.E. Strategy, the surrounding sites can begin the implementation process.

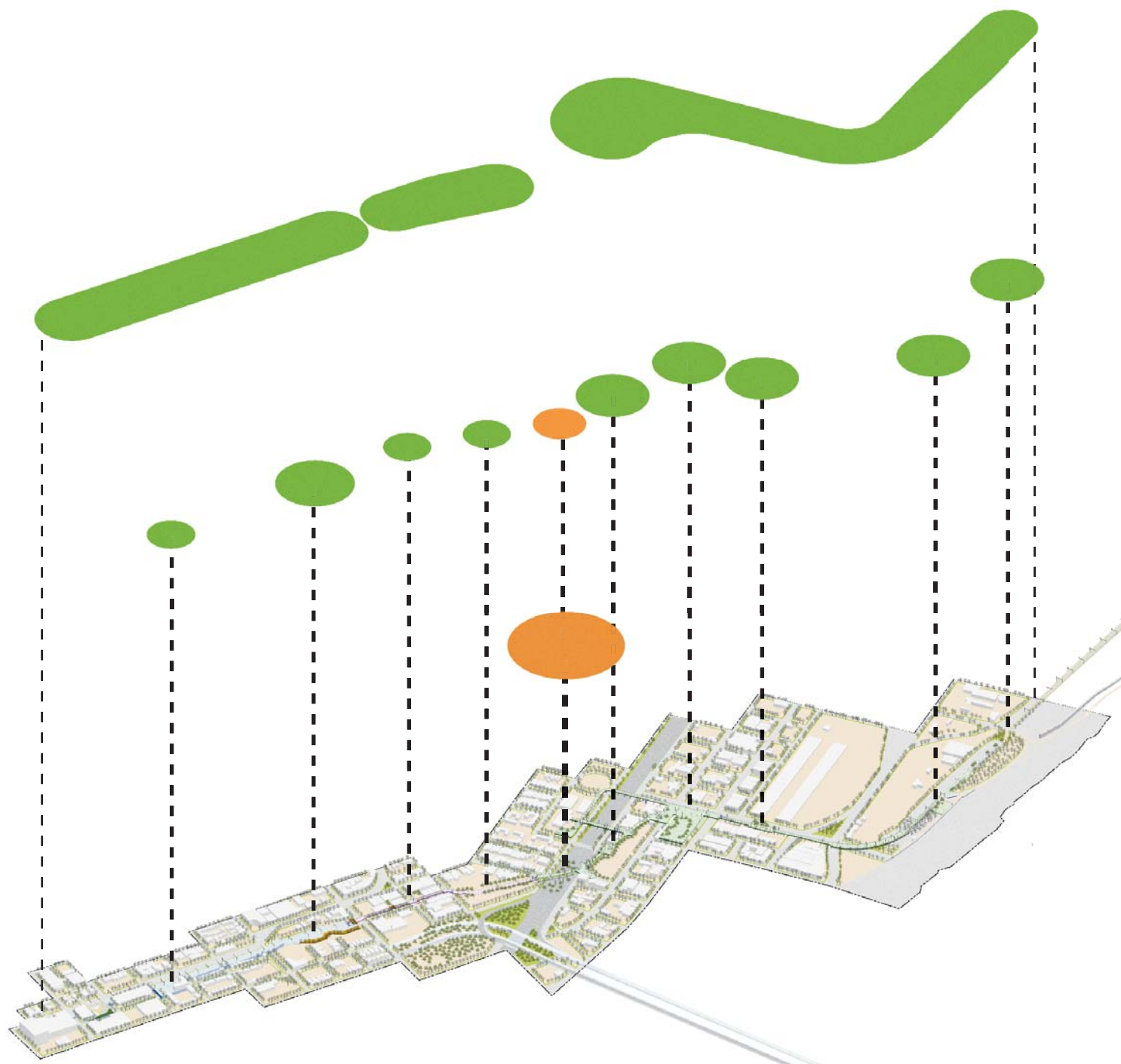
**extending the impact**

The conceptual framework's influence and success on one site suggests implementation can occur on the remaining nine sites. By theoretically testing the solutions on the nine other sites, the conceptual framework first aims at *direct* impact on the Trestle's existing structure.

After succesful initial implementation, the strategy fulfills its goal to catalyze economic and residential development by *indirectly* influencing adjacent developments. Neglected structures, potential open spaces, and connective links are noted as the Trestle extends from the existing line and integrates with the surrounding context.

Lastly, after initial direct on-rail impact and indirect near proximity influence, the Trestle successfully displays the implementation procedure enabling efficient, public, inclusive, ecologically and socially sustainable open space devvelopment. The open space proposal extends from merely on-site measures to show the potential impact of the conceptual framework's implementation at multiple varying scales.

See f 2.27.



## phasing [structure type one - elevated rail]

### site one

*The gateway* proposes a sustainable farm introduction with unique, identifying, branding elements.

### site two

*The elevated working riverfront* proposes a living landscape mesh that transforms over time.

### site three

*The elevated industrial quarter* proposes accessible links with ramps, elevators, and transitions from ground to elevated level.

### site four

*The elevated commercial district* proposes integration with the business district and structures through sustainable, walkable, and functional rooftop access.

### site five

*The open space below elevated* proposes initiating a new revamped definition of park adjacent to the bridge development.

### site six

*The bridge* is located along a transition point between elevated and ground level.

See f 2.2.8 a, b, c.



f 2.28a location plan for structure type one - elevated rail with six sites delineated, illustration created by designer 2009

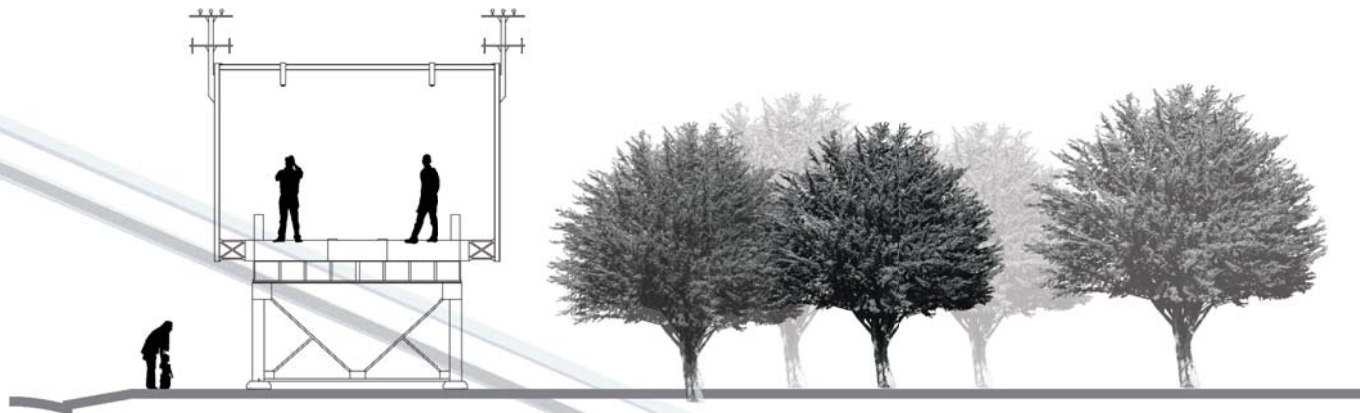




f 2.28b identifying structure type I axonometric. illustration by designer 2009



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f 2.28c typical section for structure type one - elevated rail with six sites delineated. illustration created by designer 2009

## phasing [structure type two - transition and ground level]

### site six

*The bridge is located along a transition point between elevated and ground level.*

### site seven

*The ground to street level transition proposes an urban-residential revived quarter with urban agriculture and renewable resource farm.*

### site eight

*The ground level trackage proposes several commercial and residential options, placing previously used Trestle lines to abut structural additions.*

See f 2.2.9 a, b, c.



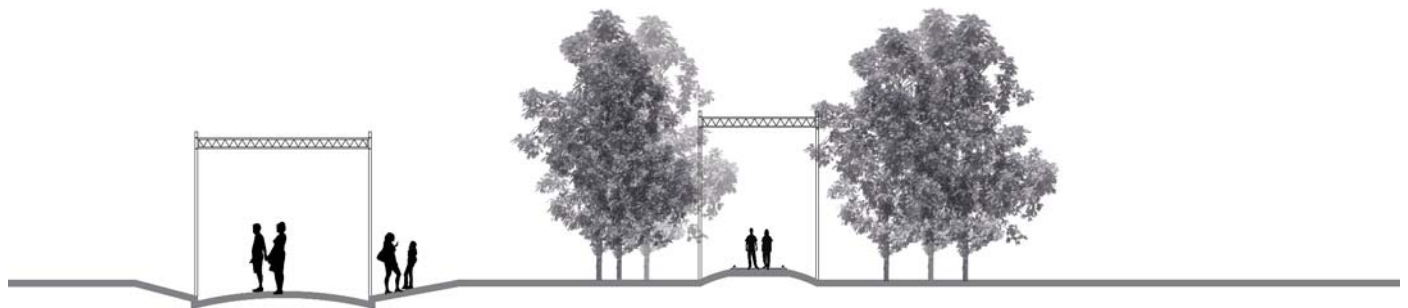
f 2.29a location plan for structure type two - transition and ground level with three sites delineated, illustration created by designer 2009



f 2.29b identifying structure type two axonometric - transition and ground level with three sites delineated, illustration created by designer 2009



125



f 2.29c typical section for structure type two - transition and ground level with three sites delineated, illustration created by designer 2009



## phasing [structure type three - subway and street-level extension]

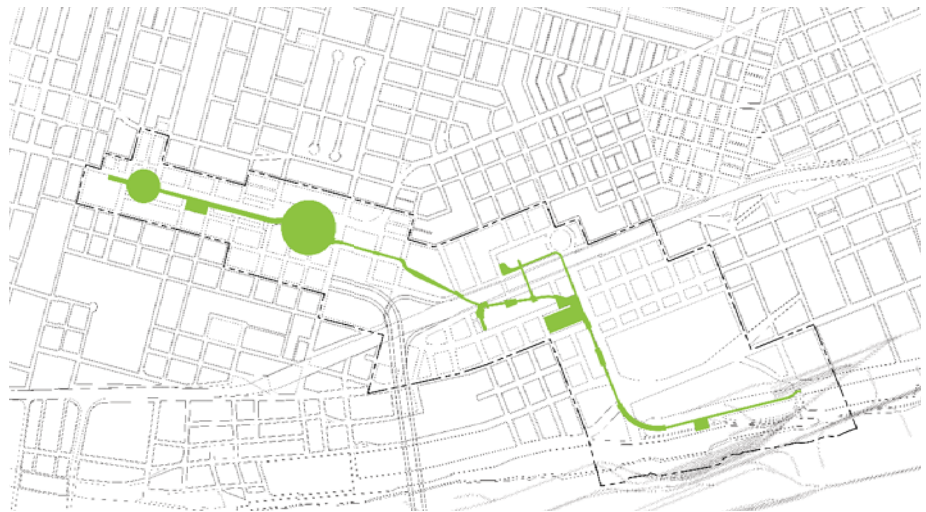
### site nine

*The subway transition entrance* proposes a transitional environment shifting to accommodate crowd-based events, facilitating a mixed-use community with residences to the south and commerce to the north, and creating a catalytic economical and entertainment area destination point.

### site ten

*The underground subway-street extension* proposes submerging below the street to create a unique underground to street level connection. If possible, the creation of a high-speed transportation rail could be coordinated with the already constructed subway tunnel and the adjoining depot at the Midwest Terminal Building.

See f 2.30 a, b, c.



f 2.30a location plan for structure type three - subway and extension with two sites delineated. illustration created by designer 2009

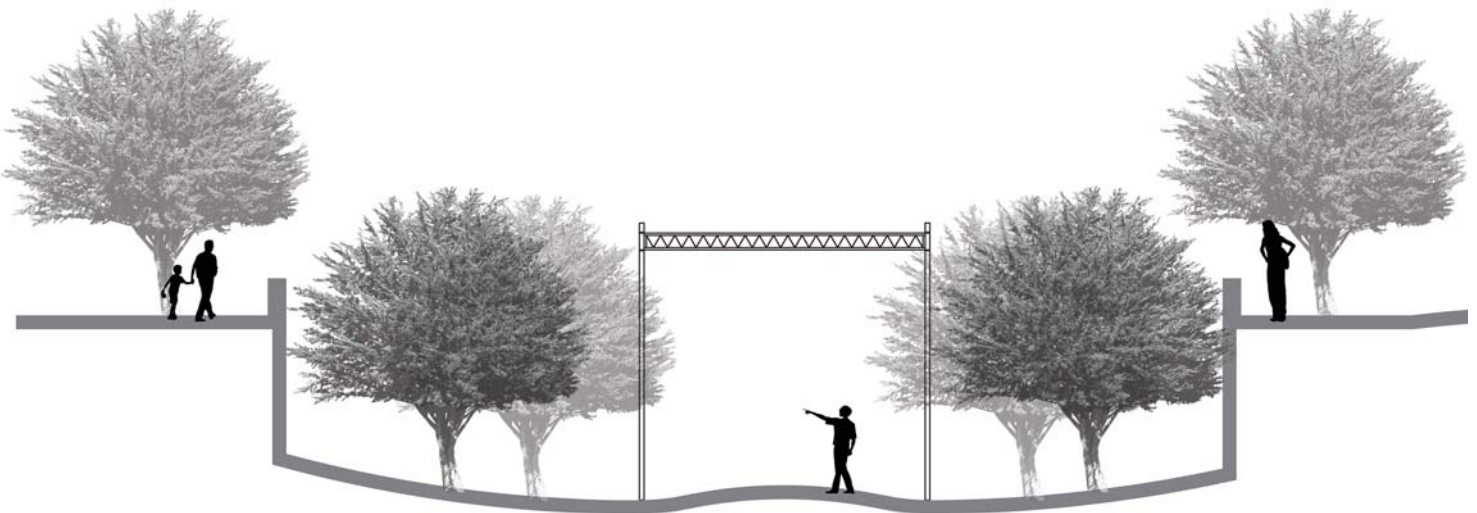




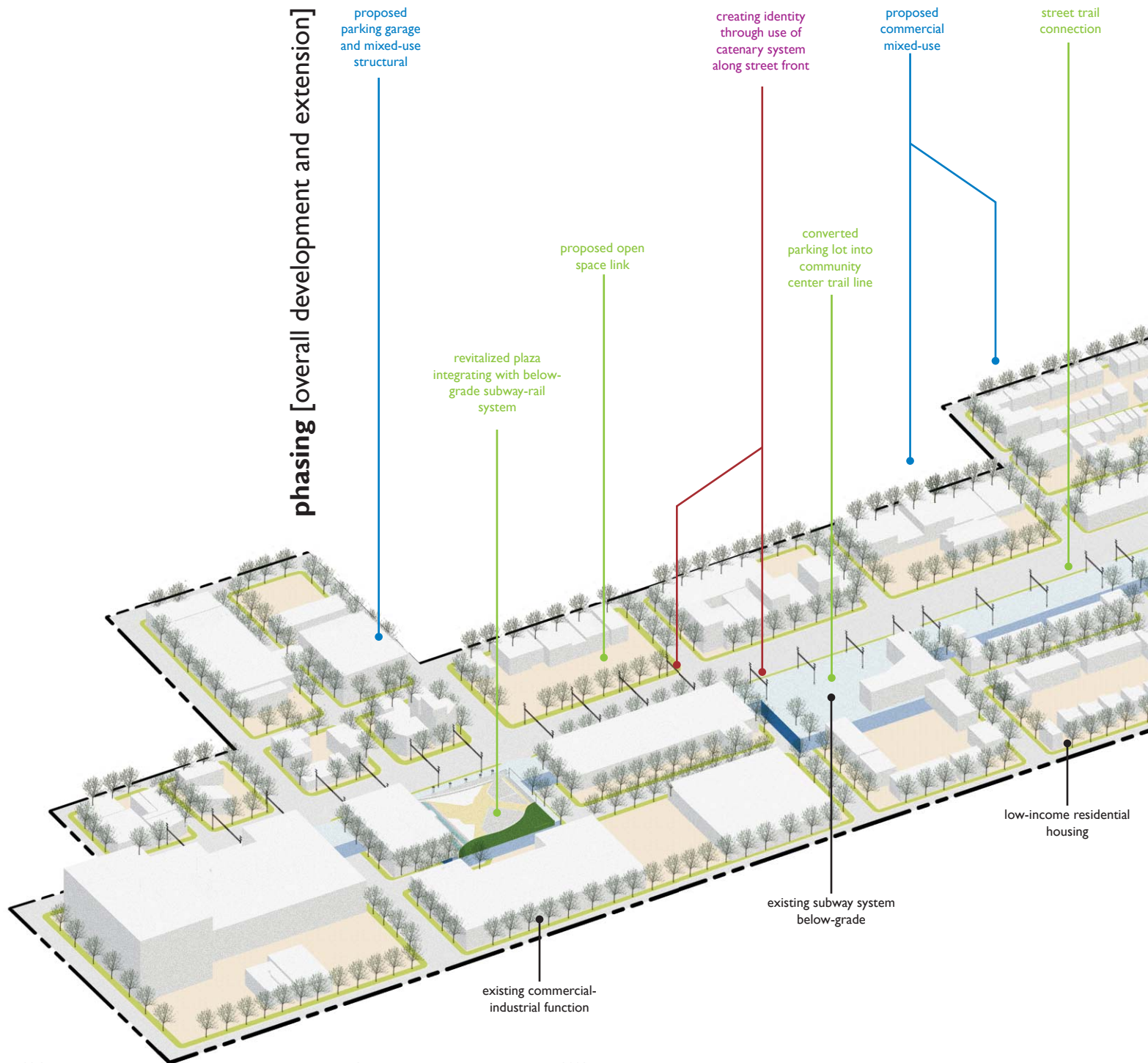
f 2.30b identifying structure type three axonometric - subway and extension with two sites delineated. illustration created by designer 2009



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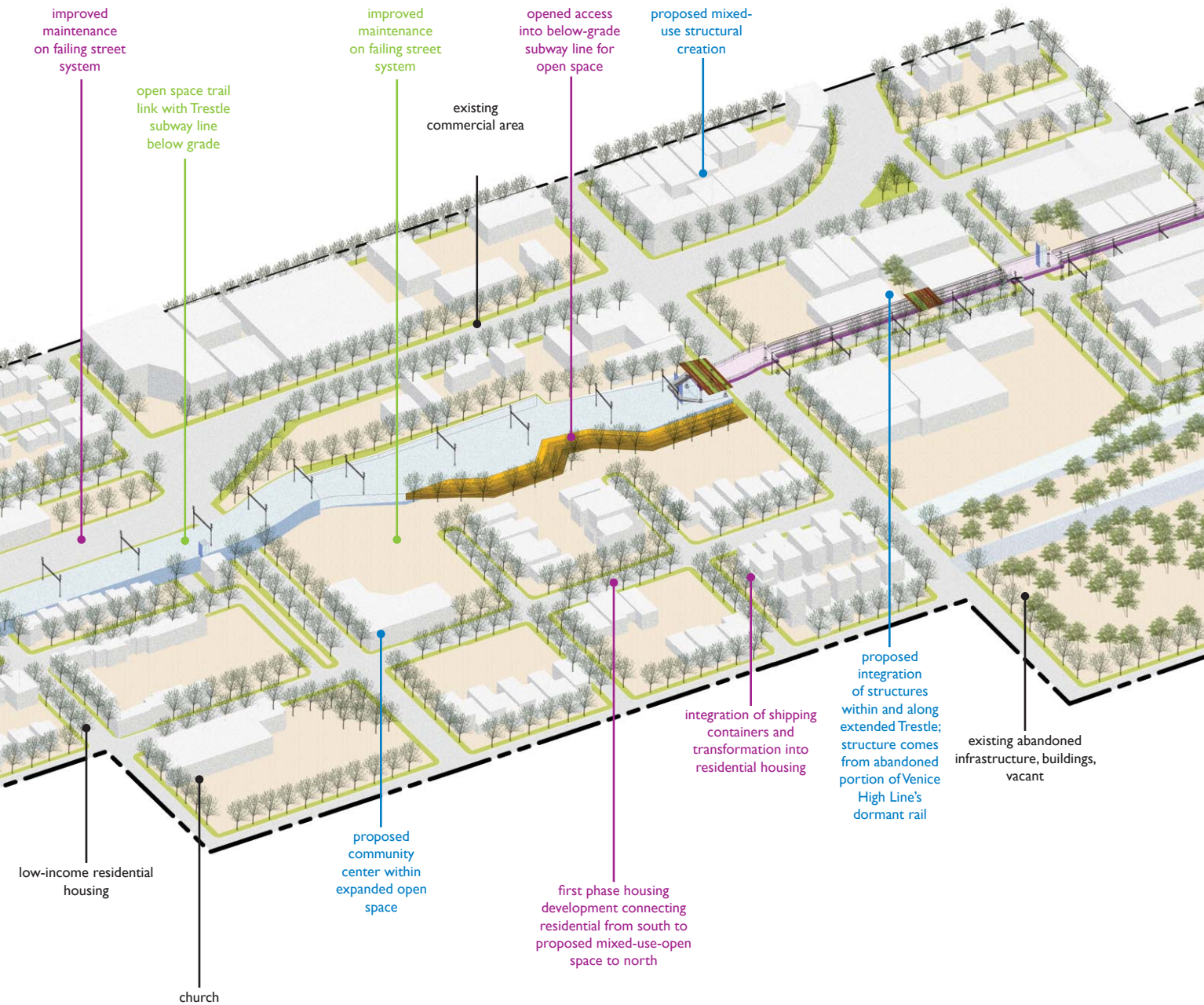


f 2.30c section structure type three - subway and extension with two sites delineated. illustration created by designer 2009



f 2.31 axonometric view of Trestle line implemented system 25 years later. illustrated by designer 2009









market street revitalization  
current proposals

proposed  
townhouse  
style residential  
development

recently constructed  
residential housing

proposed  
townhouse  
style residential  
development

urban agriculture,  
renewable resource,  
sustainable material  
development area  
surrounded by converted  
shipping container housing  
community

existing Franklin park  
integrated with extension  
of Trestle link across  
highway and over existing  
pedestrian bridge

extended platform over  
street for renewable energy  
collection

integration of  
abandoned  
school into  
educational  
center

extended platform on tops  
of buildings for commercial  
green roof public-private  
partnership

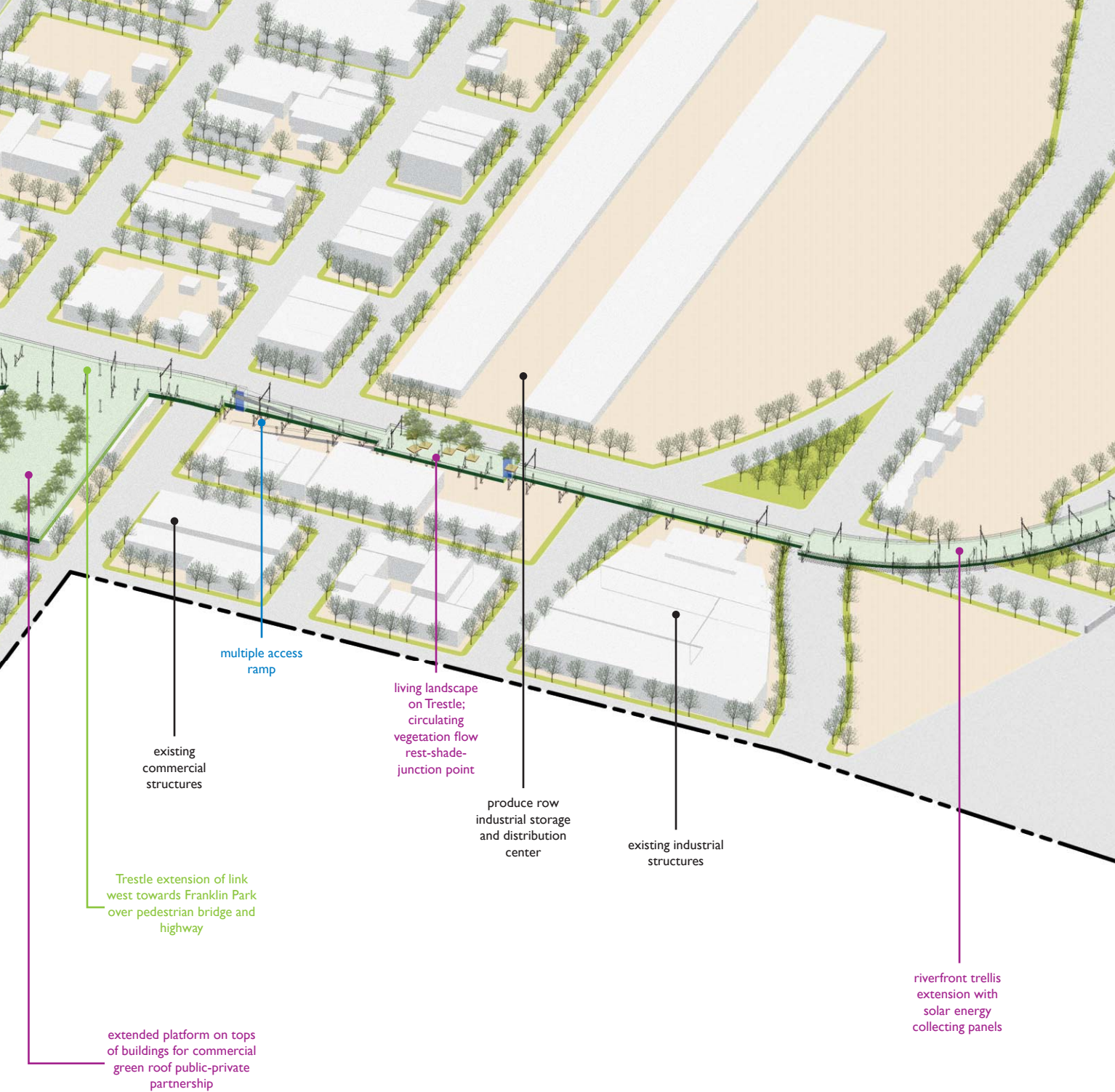
open space integration of  
elevated line and link below

proposed residential  
entertainment commercial  
mixed-use buildings

highway covered for open  
space link connection

proposed interstate  
overpass construction







existing industrial  
infrastructure:  
recycling, waste

revitalized  
branch street  
trestle paved  
with concrete

identifying  
segment of  
initial gateway to  
Trestle

sustainable farm  
- solar panels,  
wind energy,  
vegetation -  
abutting entrance

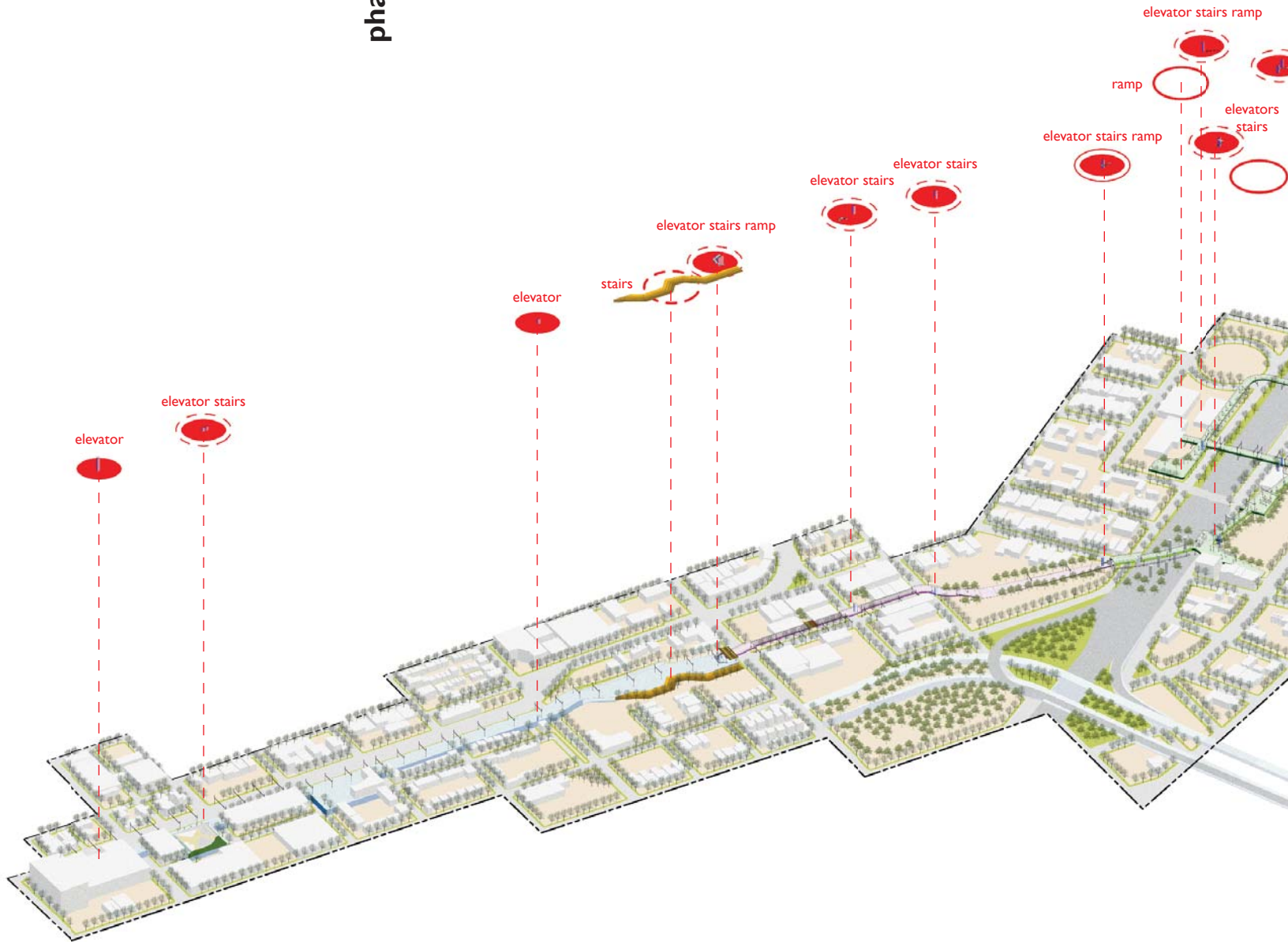
living landscape  
shelter-cover  
over existing  
riverfront  
trail access;  
connection to  
floodwall

riverfront trellis  
extension with  
solar energy  
collecting panels

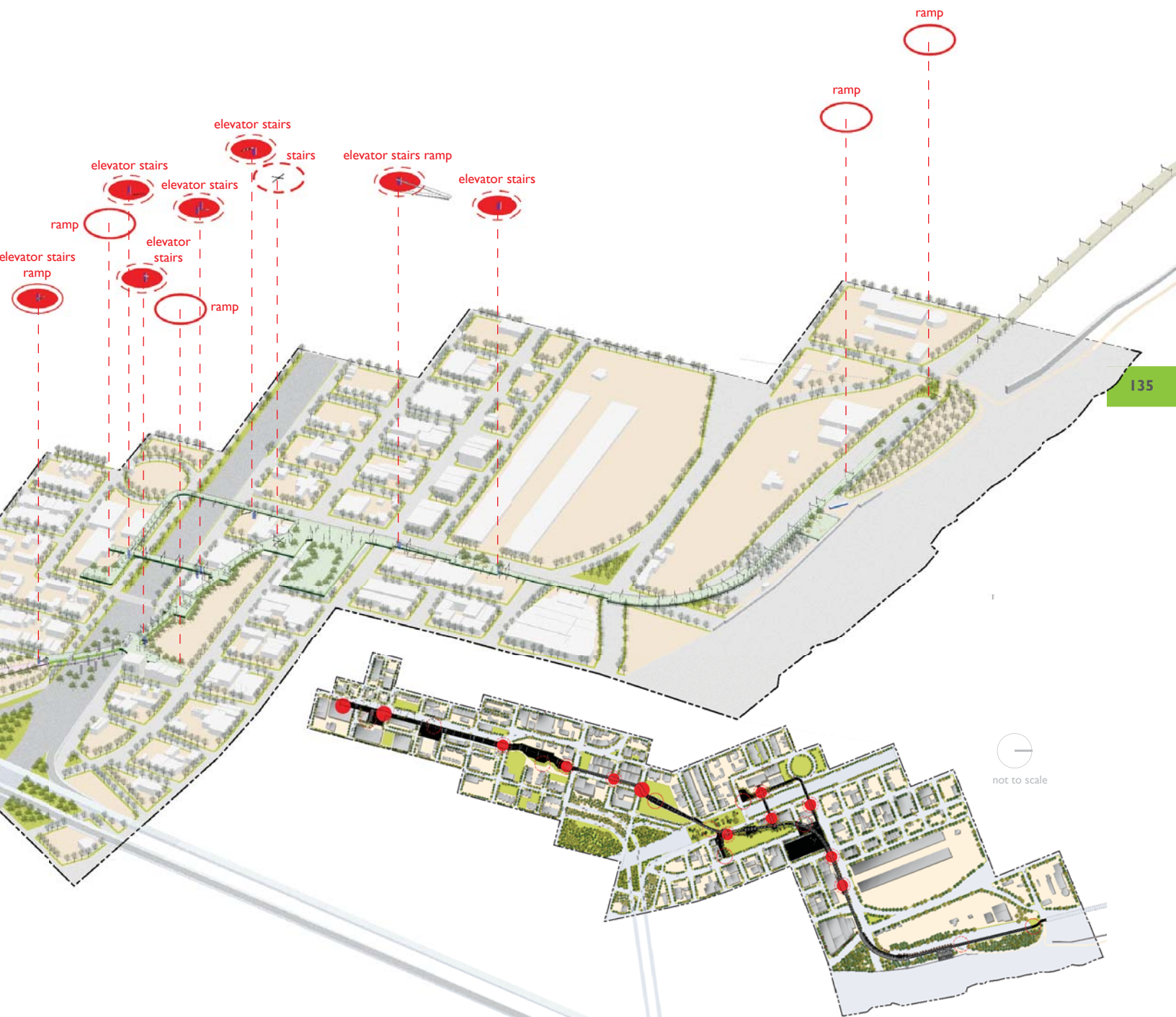




# phasing [access]







f 2.32b plan view location of Trestle line access points: stairs  
elevators ramps. illustrated by designer 2009

## phasing [overall context]

proposed future  
connective link

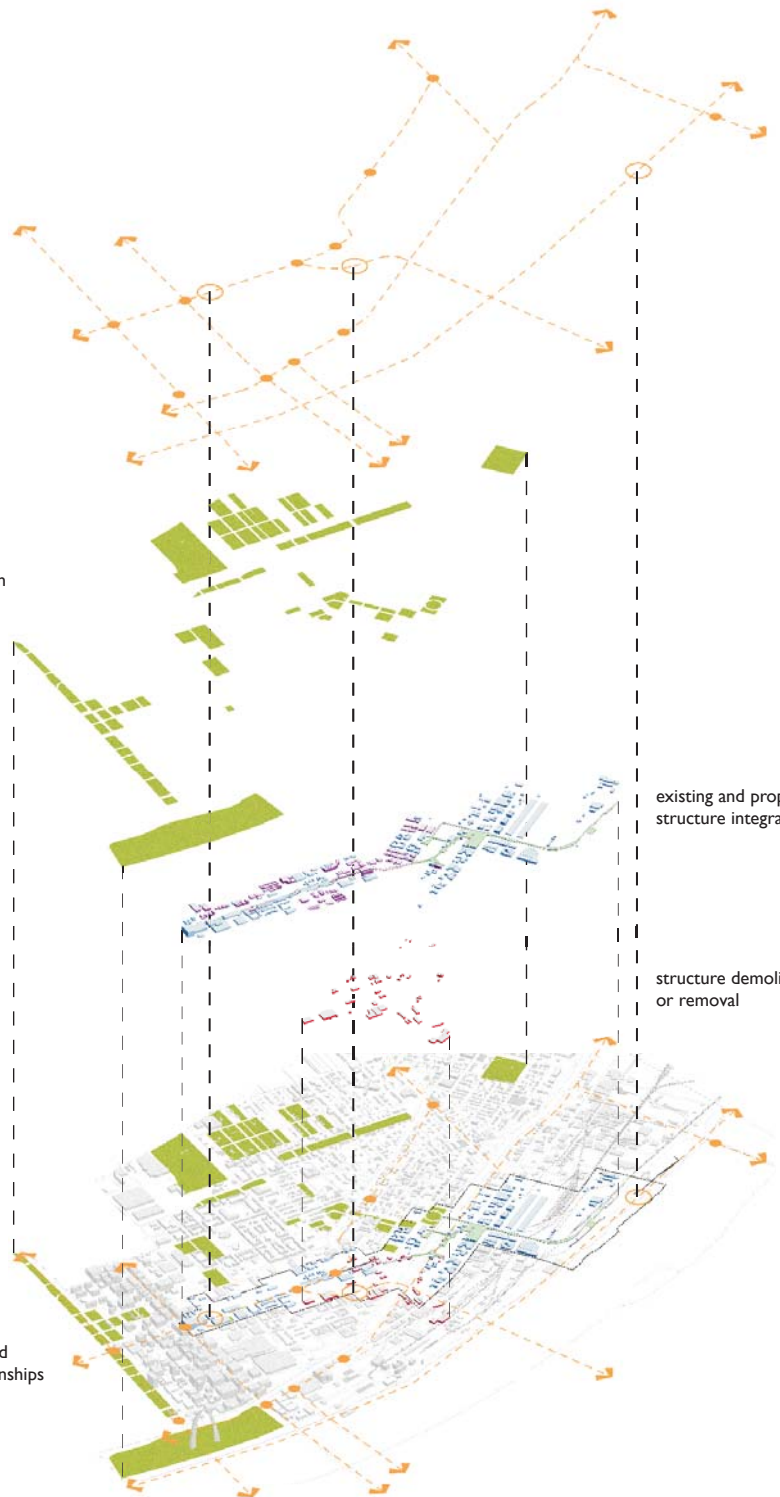
proposed full open  
space link

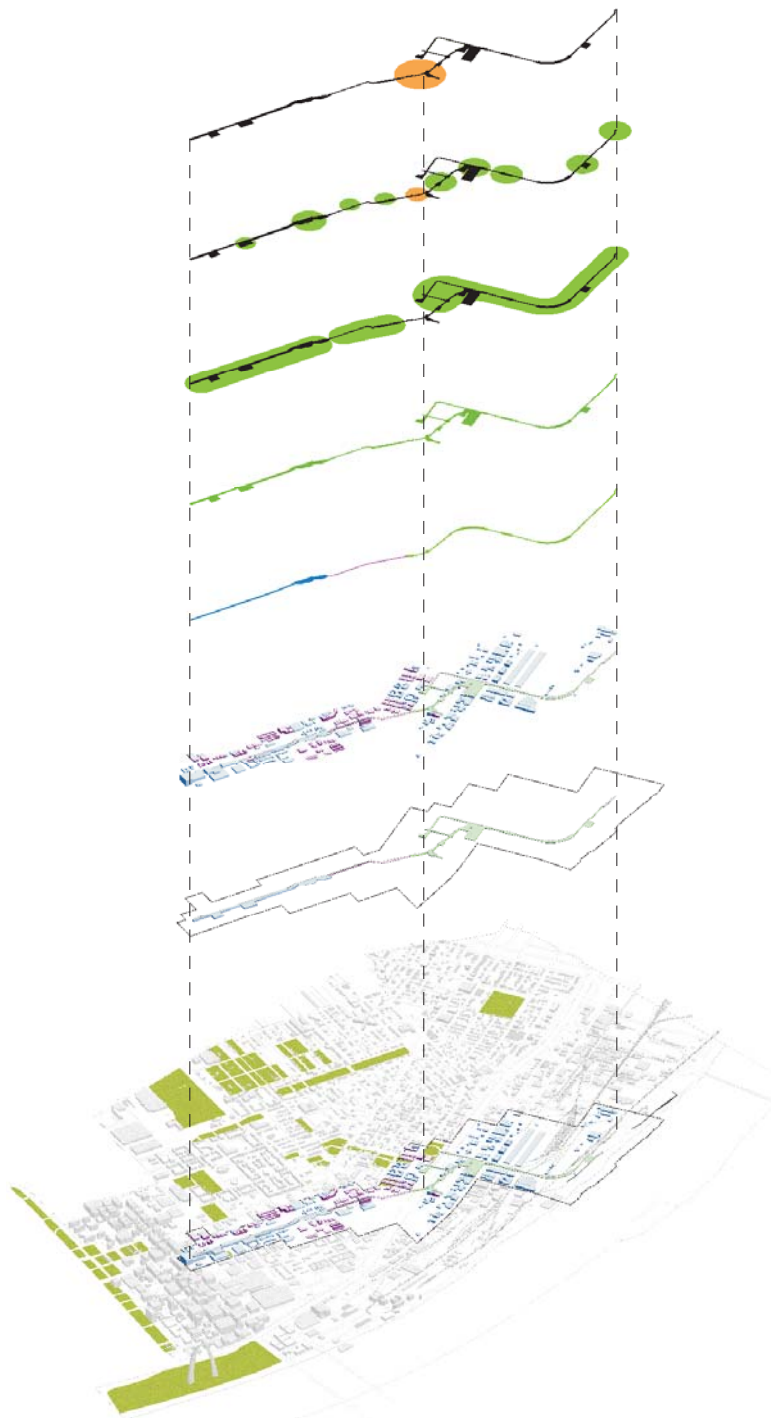
existing and proposed  
structure integration

structure demolition  
or removal

fifth ward modified  
contextual relationships

f 2.33a contextual relationships: connection, open space, proposed-existing-demolished, structural base for site six, the bridge. illustration created by designer 2009





one site selected: site six, the bridge

ten unique sites identified

three noted structural types

proposed Trestle line additions and modifications

existing Trestle line elevated, transition, and subway

existing and proposed massing along proposed Trestle line

proposed Trestle line elevated, transition, and subway

modified fifth ward base

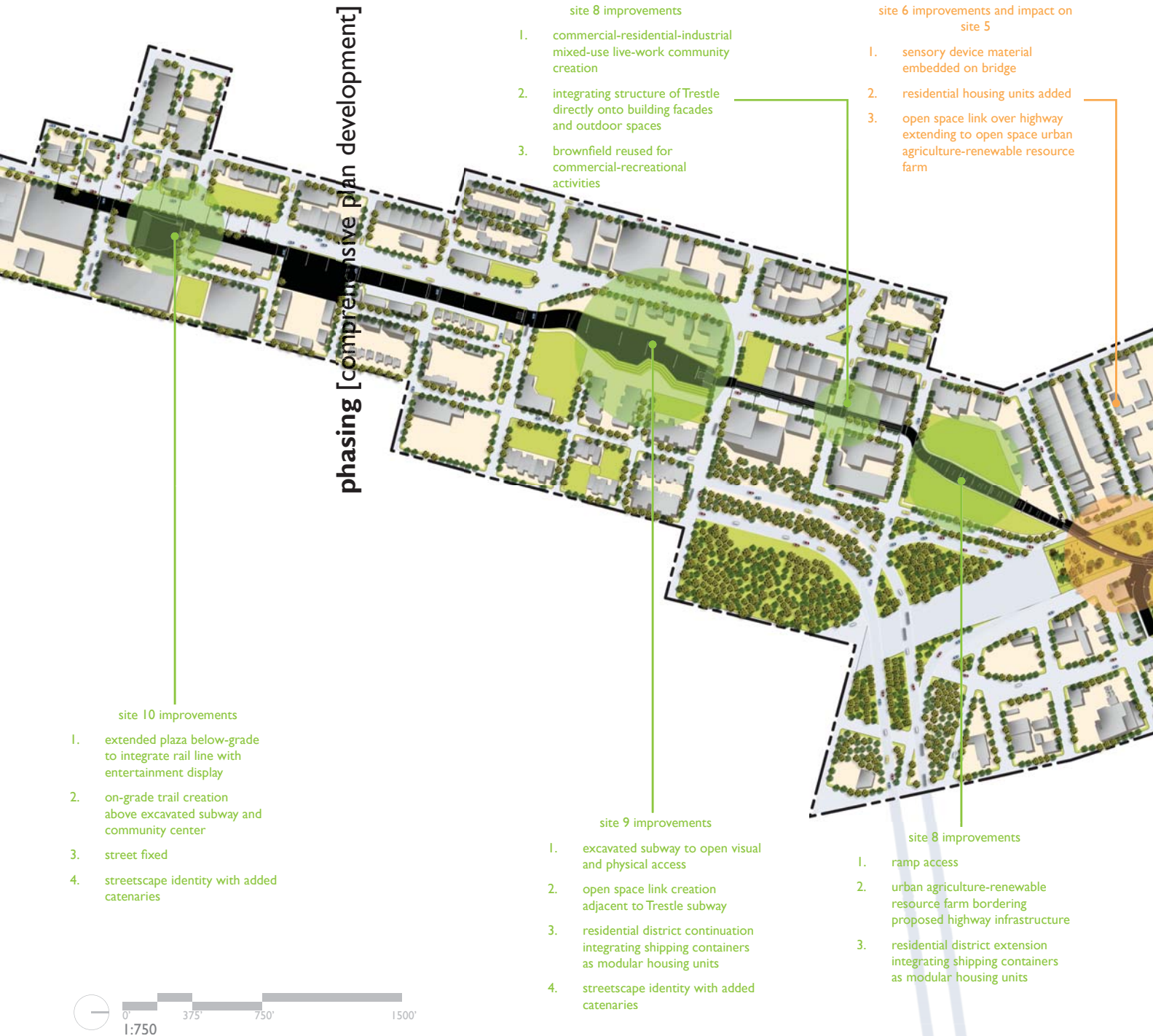


phasing [overall context]











#### site 5 improvements

1. street closing and broad open space distribution
2. access from ground level elevator and stair
3. programmatic possibilities in link created along open spaces

#### site 4 improvements

1. extended roof deck over buildings
2. creation of public-private partnership for educational-economical opportunities
3. renewable resource (solar, wind) gathering center

#### site 3 improvements

1. full ada accessibility
2. living landscape movable vegetation and structure
3. accessible views and pathways

#### site 2 improvements

1. trellis overhanging solar power gathering shade device
2. recharge station for sensory devices
3. living landscape movable shifting terrain ground plane
4. extended floodwall deck overhang

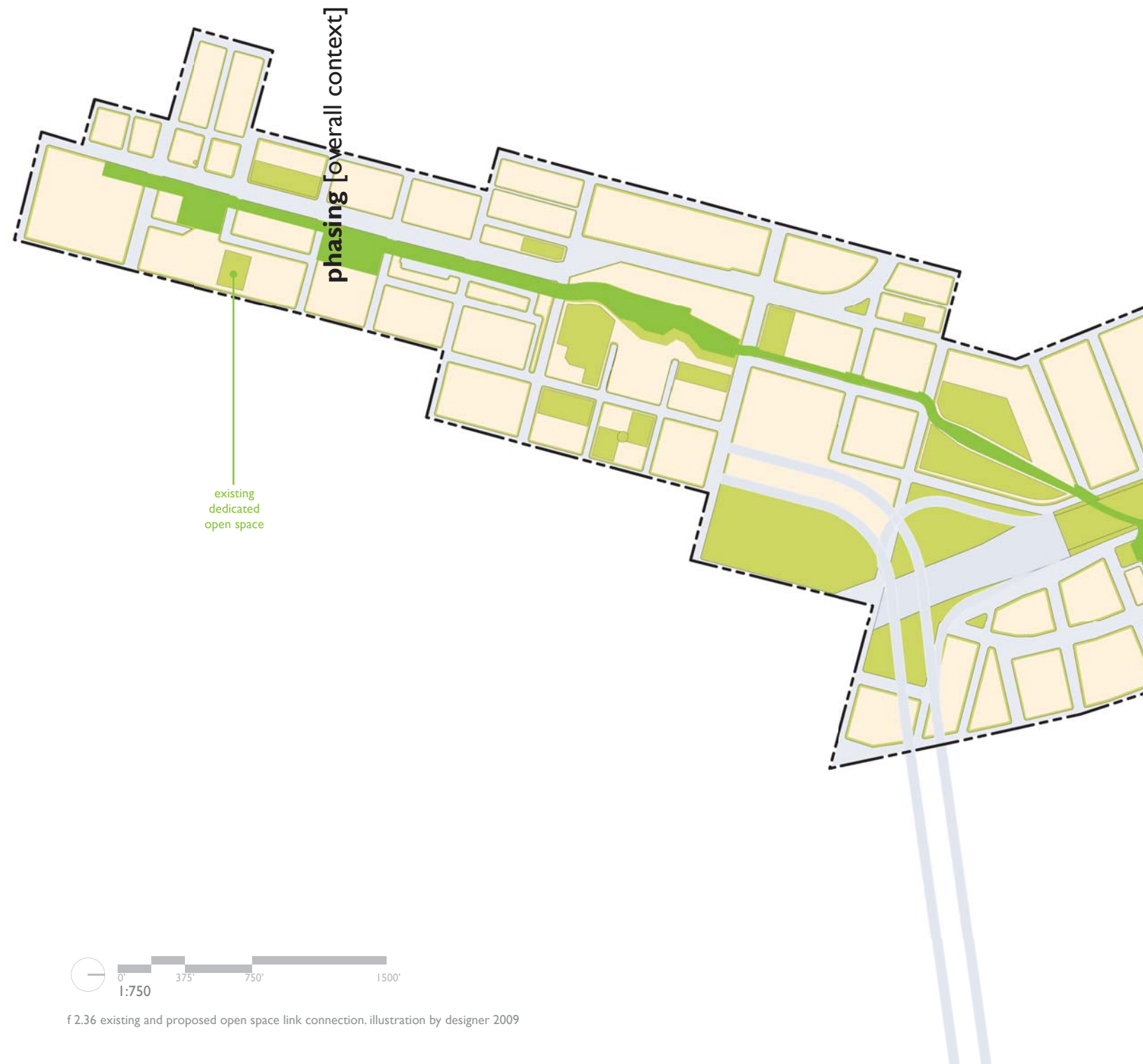
#### site 1 improvements

1. identity creation along gateway portion
2. solar, wind, and thermal renewable resource generation center
3. accessible pathways, views, and branding of the Trestle

#### site 6 improvements and impact on site 7

1. responsive controls embedded and allowing user control of structural capabilities
2. extending platform towards open space below
3. solar panel trellis for shade and power generation
4. identifying feature along vertical fenestration





f 2.36 existing and proposed open space link connection. illustration by designer 2009



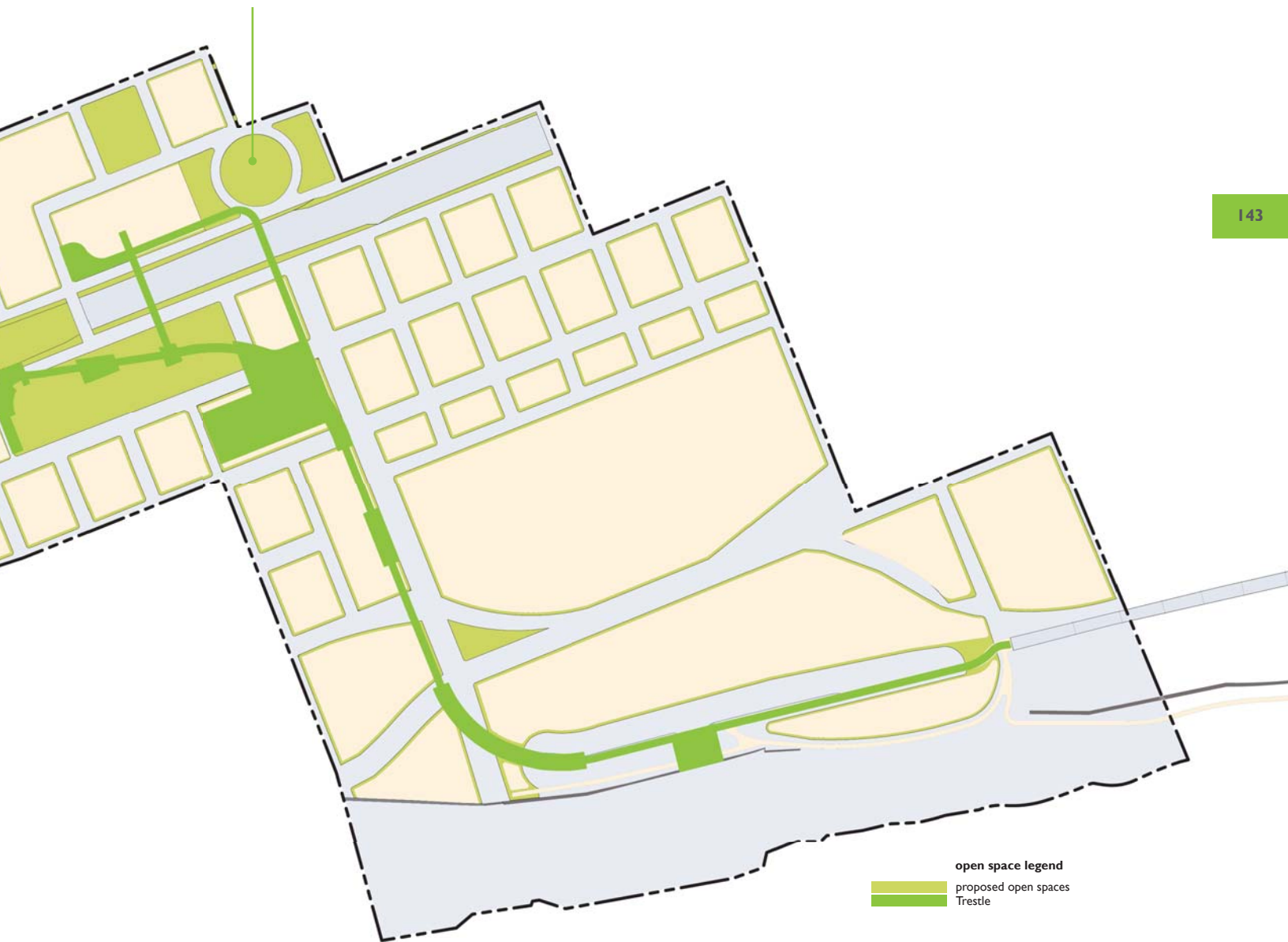
open space legend

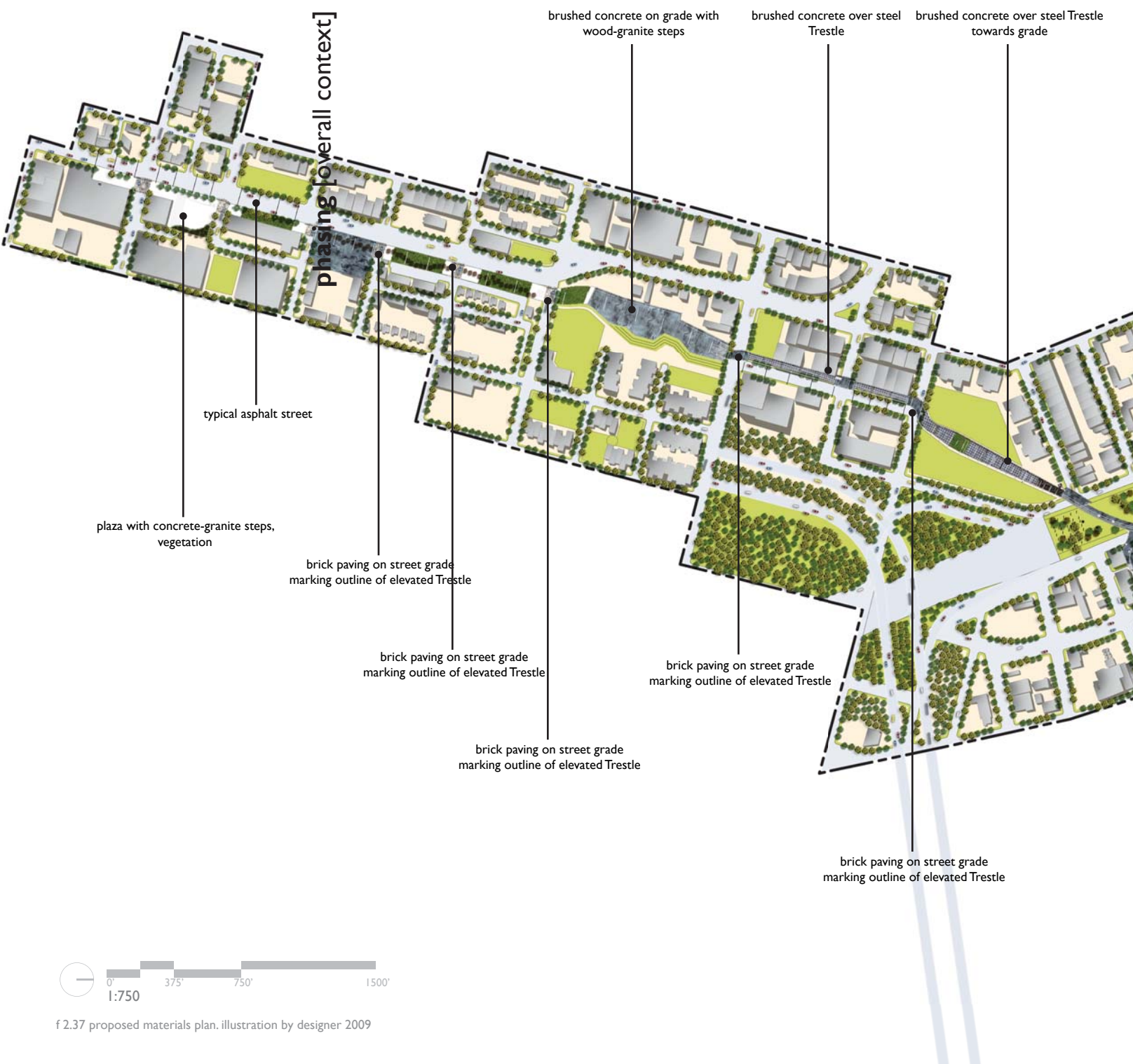
- proposed open spaces
- Trestle

existing  
dedicated  
open space

open space legend

- proposed open spaces
- Trestle





phasing [overall context]

brushed concrete on grade with  
wood-granite steps

brushed concrete over steel  
Trestle

brushed concrete over steel Trestle  
towards grade

typical asphalt street

plaza with concrete-granite steps,  
vegetation

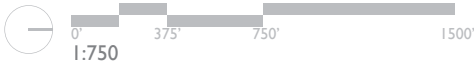
brick paving on street grade  
marking outline of elevated Trestle

brick paving on street grade  
marking outline of elevated Trestle

brick paving on street grade  
marking outline of elevated Trestle

brick paving on street grade  
marking outline of elevated Trestle

brick paving on street grade  
marking outline of elevated Trestle



f 2.37 proposed materials plan. illustration by designer 2009

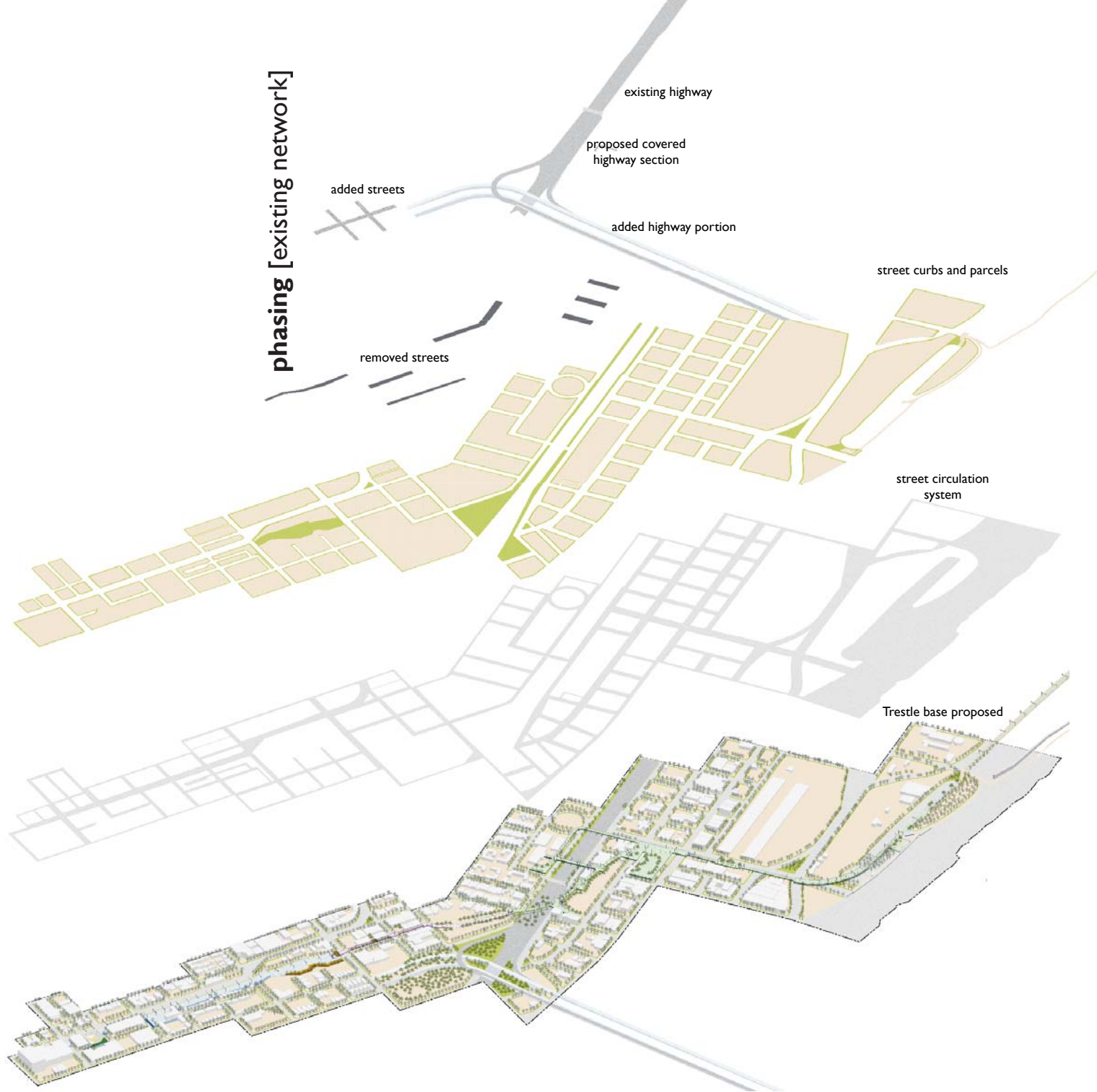
wood or granite rooftop extension  
over buildings with wood accents

brushed concrete over steel Trestle

brushed concrete-integrated rail-  
vegetation-wood accents

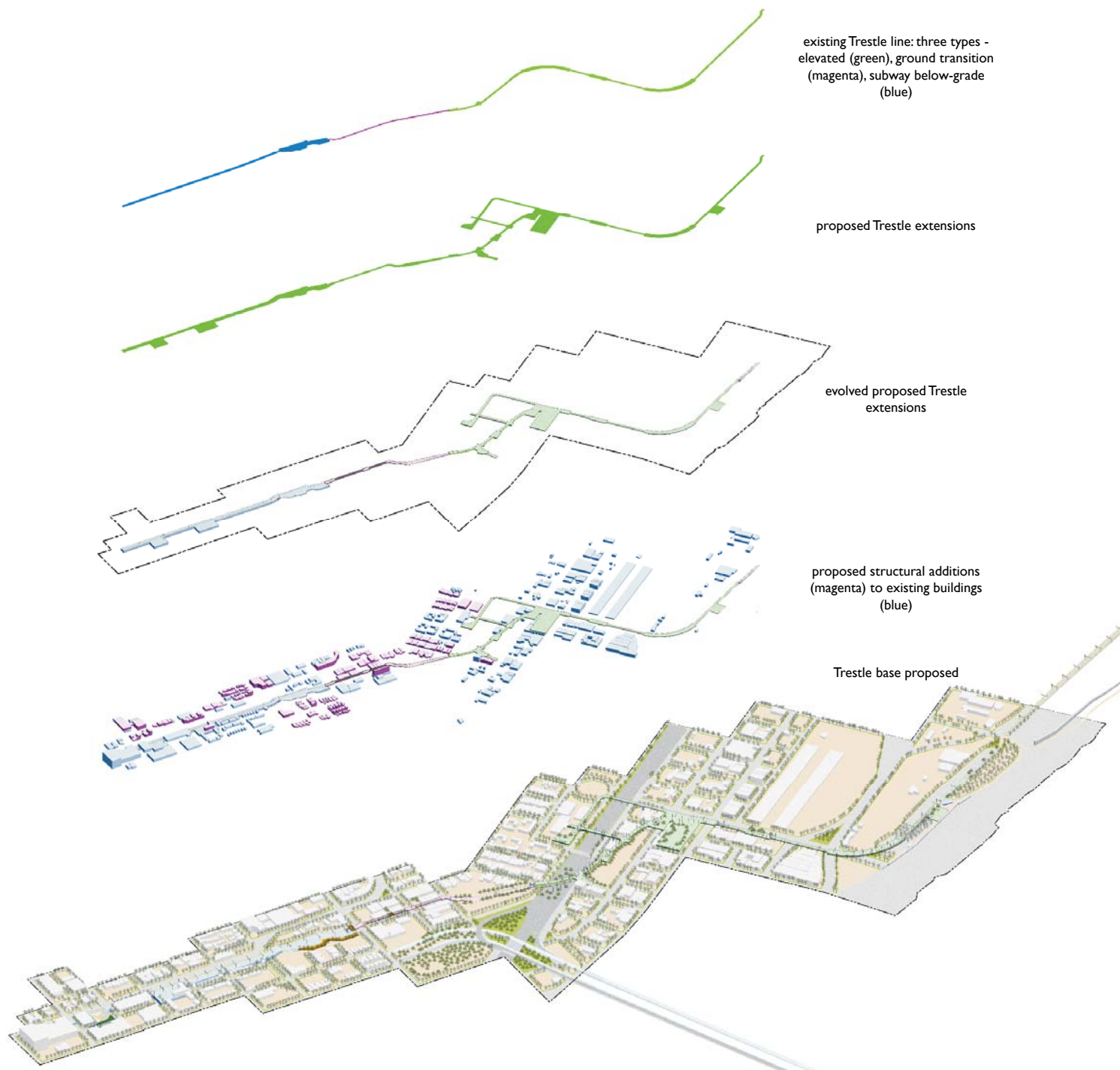
granite accent points





f 2.38 existing networks: circulation vehicular, parcels, removed streets, added streets, new highway. illustration by designer 2009



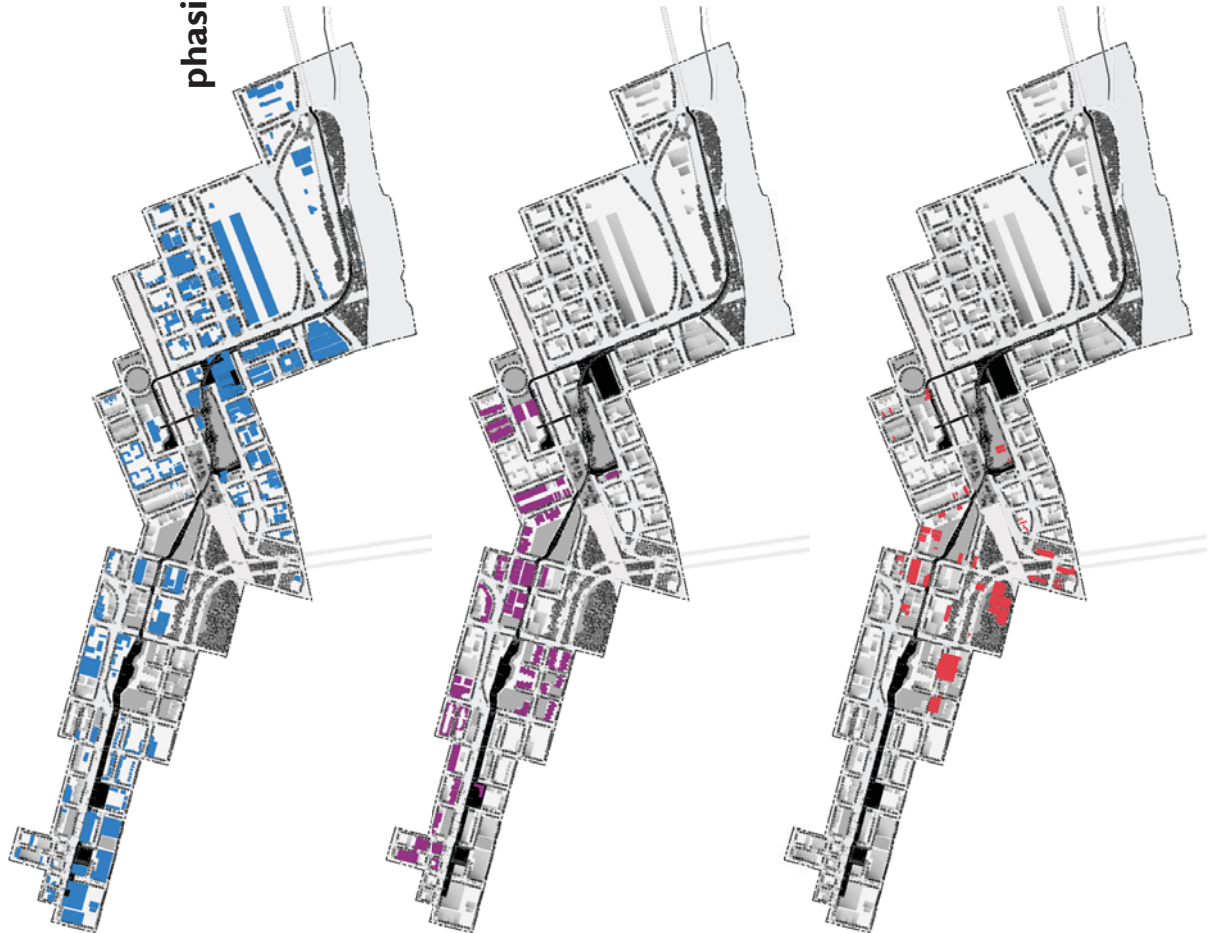


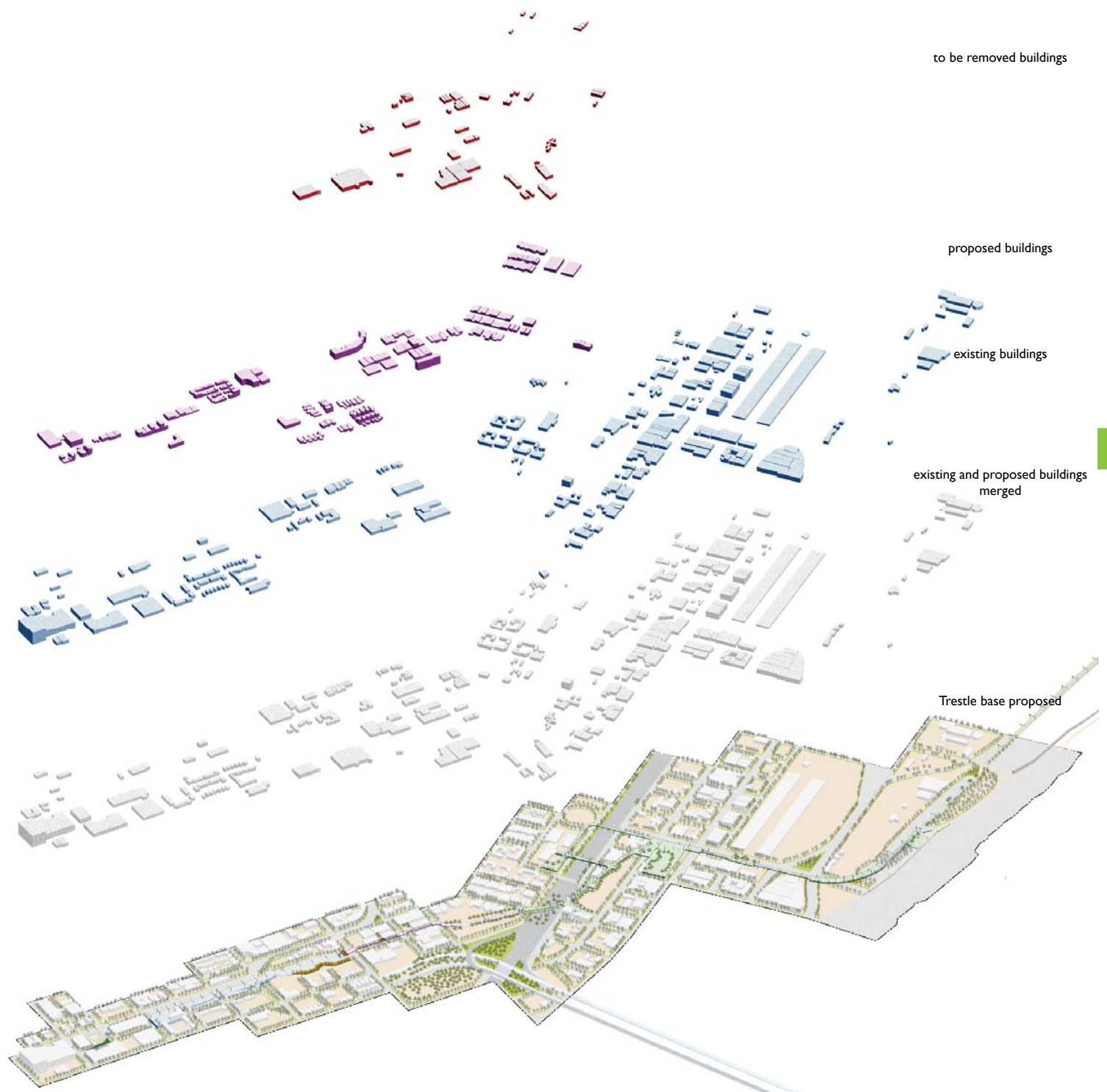
## phasing [existing-proposed-remove]

Focused on retaining the majority of structures, proposing necessary functions and potential future programmatic shifts, and removing unfit, neglected, and structurally failing buildings, the massing plan calls for the adoption of a logical phasing plan in the implementation of the structural program.

The existing system's suburban scale structures in the north St. Louis area led to the proposal of small to medium height buildings. Service, commercial, and entertainment venue creation is proposed but contingent upon the success of the surrounding proposed residential developments. The buildings to be removed typically consist of buildings structurally unsound or are slated for demolition.

The adaptive reuse of any structure is integral to the sustainable adoption of the S.R.A.M.E. strategy, and thus the focus on keeping the existing over proposing new designs.





## phasing [open space determination]

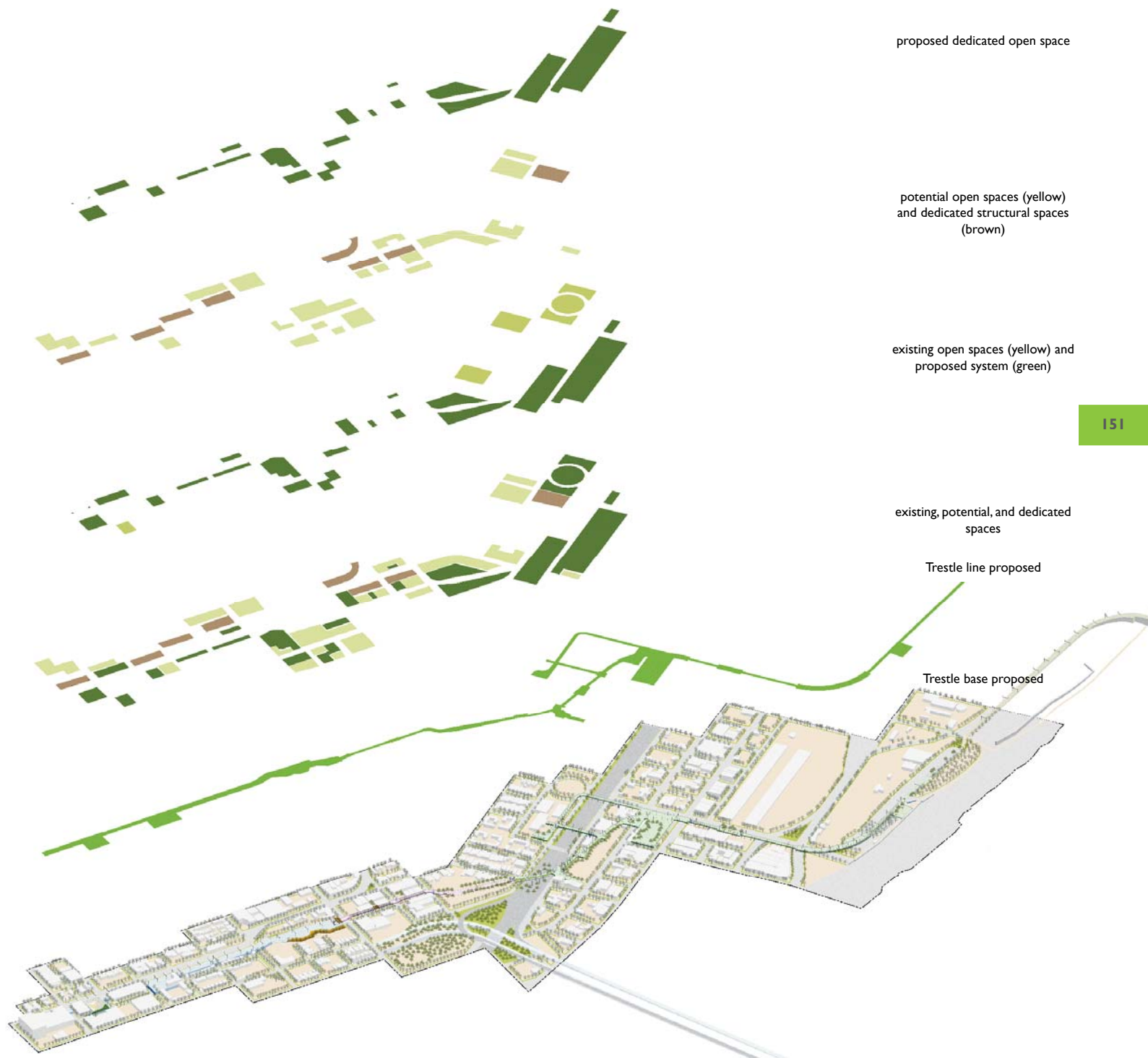
In order to create an effective open space network, a systematic procedure must be undertaken.

First the Trestle line is extrapolated from the proposed base.

Next, existing and potential sites for open space seeding are noted. Potential sites can become building sites while dedicated open spaces include areas set aside for no current building construction in order to retain and create a revitalized open space link

The existing context merges with the proposed dedicated open space sections while the remaining potential sites take on potential structural opportunities. The goal is to eventually create a linear trail along the line, extend the strategy outwards to eventually influence structures-buildings, and link back to existing large open-space systems.





## phasing [long-term five-step implementation method]

Paralleling the S.R.A.M.E. Strategy notions, the long-term phasing for the reconstruction and revitalization of the Trestle as a redefining notion of contemporary inclusive, public open space design hinges on the success of the implementation methods and strategies.

### **seed [sense]**

First, site boundaries must be established. A boundary approximately one-quarter mile any direction from the main line, or the typical 5-minute walking distance, serves as the guiding base for increasing pedestrian connection. By first noting the existing open spaces, a potential link following and adjacent to the Trestle line can also be established within the boundaries.

### **revive [respond]**

Next the Trestle line's original route must be extrapolated. Noting that the path ends once reaching the southern end of the bridge overpass along the highway (near the center of the site boundaries), the Trestle continues along unmarked portions of ground and below-grade structure until approaching the Midwest Terminal Building (below-grade) two blocks north of Washington Avenue and downtown proper.

### **extend [adapt]**

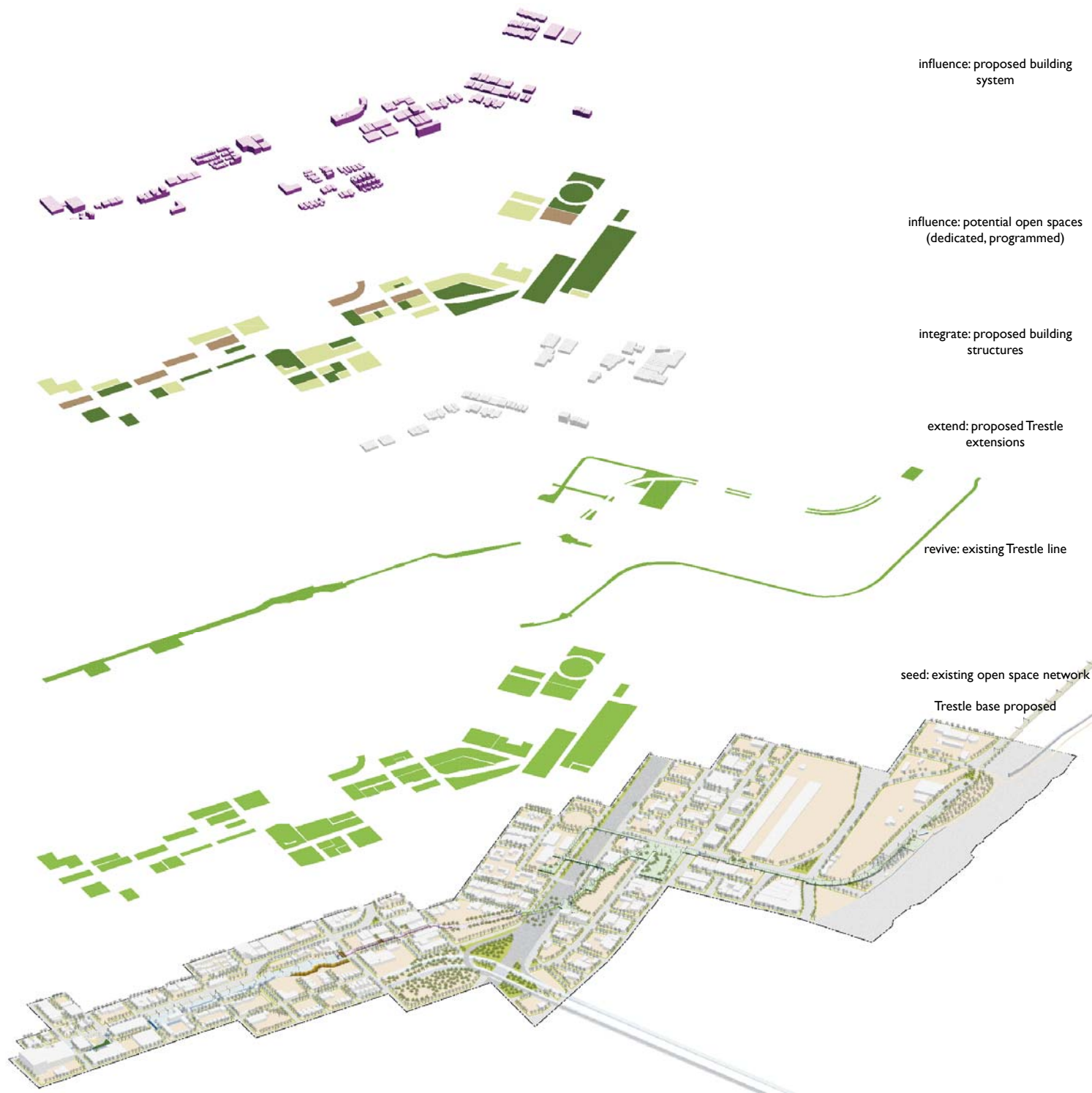
The Trestle can then begin to expand or contract dependent on foreseen changes (known) and potential occurrences (undeterminable). Extended decks, platforms, and visually-physically accessible spaces is necessary to integrate pedestrians into the open space experience.

### **integrate [mutate]**

The extended deck then integrates with the surrounding context taking on more vital physical structural roles. Use or disuse highly determines the outcome of success of the Trestle. As one use shifts to another, so too does the structural character.

### **influence [emerge]**

The success of an emergent system is in the ability to influence past the localized adjacencies. The real-time reactions that had occurred directly on the Trestle must translate into potential solutions or options to revitalize the surrounding area.







# CONCLUSION



The five steps of the *discover* process (inventory, analysis, idea-tage, program, concept), coupled with the research surrounding the programmatic precedents and three contextual precedents (Promenade Plantee, High Line, Bloomingdale) enabled the formulation of the applied S.R.A.M.E. Strategy conceptual framework.

Each phase had to occur in a linear process, moving from site finding, observation, and information gathering to detailed assessment, analysis, and synthesis into workable design proposals. However, each phase alone would not suffice. The *discover* process was conducted in a cyclical feedback loop. Each phase fueled the other, creating connections, and establishing future design decision direction.

### **process philosophy**

The fundamental consideration in the process was the link between the established idea-tage visioning graphics and the connection to potential program and conceptual development. The abstract ideas did not necessarily indicate how or why a certain method was selected but provided guidance in where to move forward. Program tied the abstract ideas and conceptual designs into a cohesive solution. As the program continued to develop and direct directions as opposed to specific site elements, conceptual design too evolved.

### **assessment**

The question posed: Is there a need to expand the current role of professional landscape architecture practice? How may our discipline expand and achieve a more socially directed purpose? Alan Berger's *Drosscape* provided an initial guiding maxim for the Trestle strategic approach as he suggests that "In many cases a client may not even exist but will need to be searched out and custom-fit in order to match the designer's research discoveries. In this way the designer is the consummate spokesperson for the productive integration of waste landscape in the urban world" (2006, 4).

Within *Urban Diaries*, Walter Hood suggests "throwing away irrelevant notions, moral stances, and reformist approaches to design is essential if a public space is truly to service its communities" (1997, 8). Hood suggests that the design's potential impact stems more from the resultant social benefits and less from the individual designer's authorship.

### **resultant claim**

Can the virus be cured? Can the contemporary city truly be saved? Is this strategy a valid approach to future inclusive, socially just, and equitable design?

The conceptual framework established (Sense Respond Mutate Adapt Emerge or S.R.A.M.E. Strategy) enabled the application of a theoretical interactive, intelligent approach to design. Initial observation and analysis of existing conditions led to a thorough understanding of the potential for adaptive reuse design solutions.

Research into efficient smart technological devices, synthesis into a user-defined relationship between technology and tools, and extrapolation of the conceptual framework upon the linear system led to a broad understanding of both the potentialities and the limitations of a smart, intelligent system.

### **positive benefits**

Complete understanding of existing site conditions coupled with intelligent design research led to the separation of the site into three characteristically similar groupings. Further division into ten unique sites led to realization of the missing and potential connections to be established. Defining contemporary open space design as a public, inclusive process

soon became the focus of the study on the Iron Horse Trestle. The existing site conditions of abandoned infrastructure, distinct isolated districts and neighborhoods, lack of physical and social connections, and conceptions of the ward's character dictated that individual site design would not suffice. Instead, a holistic network would need to be established.

The open space design approach implementing smart technology to enhance quality of life, catalyze economic development, and enable sustainable patterns of development found a framework in the S.R.A.M.E. Strategy. Subsequent phasing revealed the most significant site to be that most readily accessible - both physically and visually - to residents, tourists, and visitors. Site six, *the bridge*, was thus selected for both its structural traits (acting as a transition point from elevated Trestle to ground level), its position between two typically separated districts (industrial-commercial and residential), and high visual access from the main form of transportation (automobile).

The creation of site specific initiatives revealed that four parts of the S.R.A.M.E. Strategy could be readily implemented in real time (sense, respond, adapt, mutate). The emergent mechanism would then both be the on-site creation of an evolving, beneficial space while simultaneously influencing and enhancing adjacent developments. The bridge would inform and educate immediate and pass-through users while the increased residential base to the west and the enhanced open space link to the west would evolve over time. By testing the theory on the other nine sites, an efficient and user-informed, interactive, and intelligent mode of design could be established.

### **potential consequences**

The advantages of the design may contain drawbacks. First, the introduction of a technological device embedded within a public system can inspire the notions of Orwell's *1984*, wondering and waiting for the appearance of Big Brother's surveillance team. Technology, when limited to mechanical devices, prevents association with emergent systems, such as landscapes, riparian corridors, or vegetation succession. It is difficult to assess acceptance of technological advancements. While devices may enable efficient design decisions, what is the implication on the subversion of power from human to machine? Can the machine take over man?

Yet even with the limiting constraints, the intent of the intelligent systems remains singular: enabling active, public, inclusive participation in the formation of the city. The incorporation of the people into the design solution further enhances the importance of the designer as not mere author but collaborator, enabler, leader.

### **and thus**

Landscape architects are in a uniquely pivotal position to reshape the design profession, able to balance complex emergent issues with socially aware and feasible application. Students and professionals today question the relevancy of the profession – see RMIT University's upcoming Kerb journal, 17th edition entitled "Is landscape architecture dead" or examine the foundation of contemporary landscape urbanism theoreticians (Corner, Reed, Waldheim). I pose that the situation may not be as dire as claims suggest. Landscape architecture stands poised to evolve. By first looking to the socio-economic, infrastructural, and ecological contributions of the past, the profession may take the next proactive and necessary step to inspire a future direction where landscape architects can be advocates for social change.

Olmsted's 1868 Observations on the progress of improvements in street plans states that "it is the duty of each generation living in these towns to give some consideration, in its plans, to the requirements of a larger body of people than it has itself to deal with directly" (Sutton 1971, 38). Founded as a profession that provided both a valuable functional and psychological service to the public, landscape architects of the future must progress towards proactively seeking the neglected and wasted territory, the unknown and foreign, the pushed aside and forgotten. In doing so, landscape architecture may realize its inherent potential enabling the disenfranchised, enhancing our ability to practice in an inclusive, socially just, and equitable fashion.

## discover

Chapter 3 establishes site boundaries; inventories, analyzes, and synthesizes conditions; and forms a programmatic approach for each of the ten unique sites. Abstract idea generation influences conceptual development. The *discover* phase provides a framework for the application of the S.R.A.M.E. Strategy whether at whole context or individual site scales.

162

DISCOVER



inventory  
178

analysis  
204

idea-tage  
230

program  
256

concept  
282

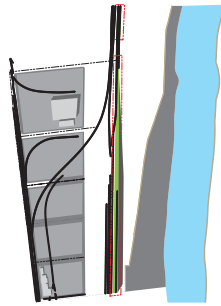


*We shall not cease from exploration / And at the end of all our exploring / Will be to arrive where  
we started / And know the place for the first time*

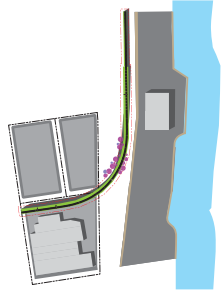
- T.S. Elliot  
Four quartets, "Quartet 4: Little Gidding"

identify [inventory]

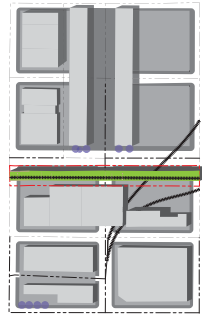




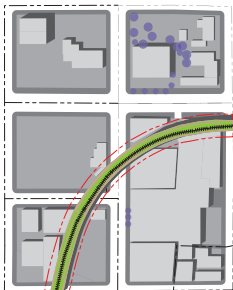
1



2



3



4



5



identify [inventory]

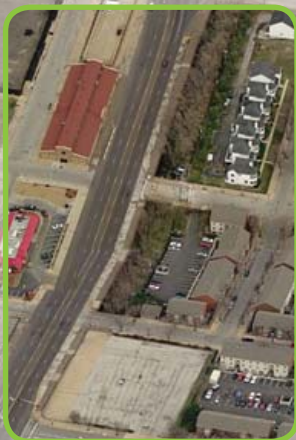
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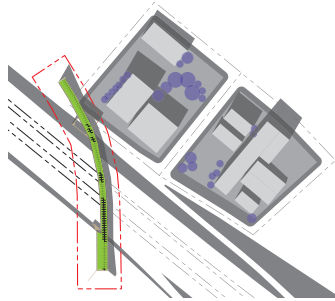
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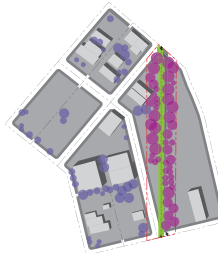
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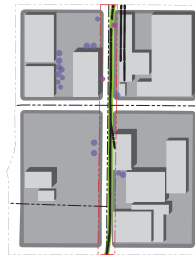




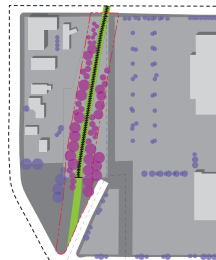
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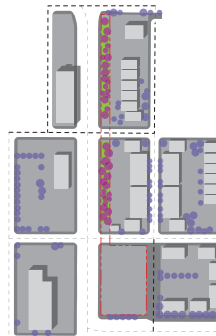
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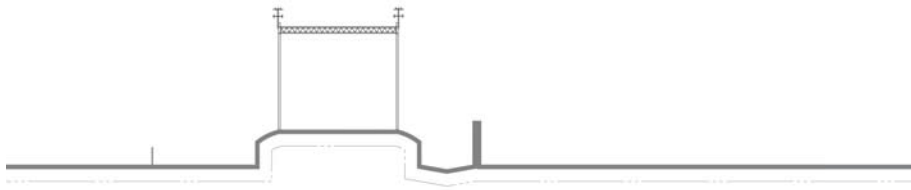


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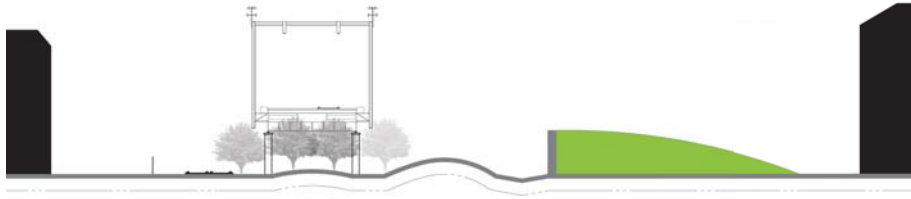


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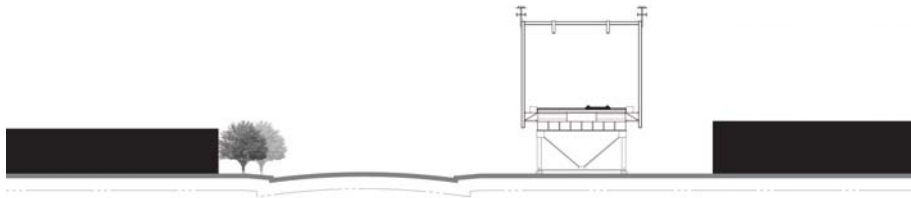




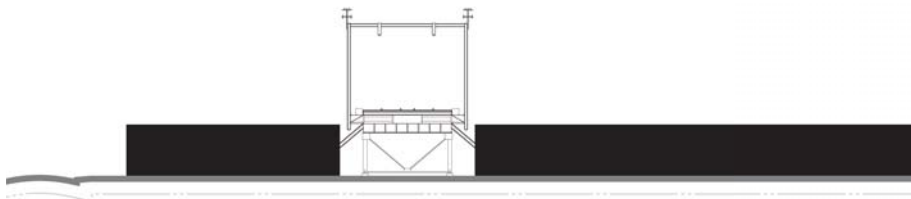
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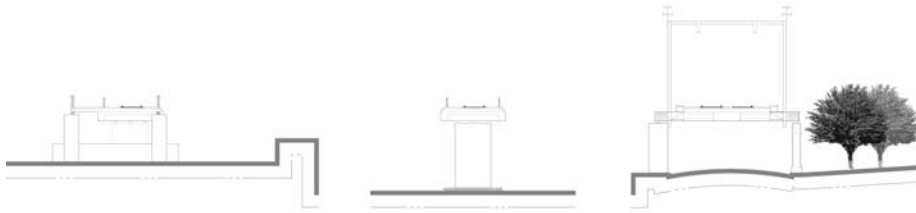
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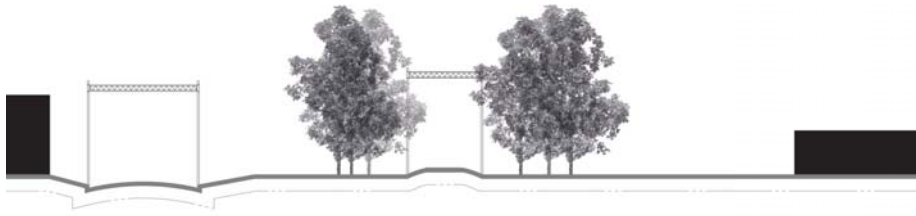
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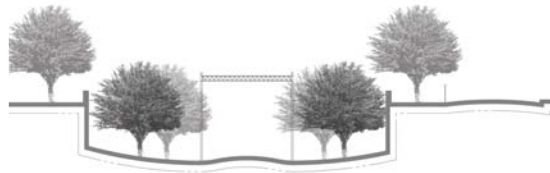
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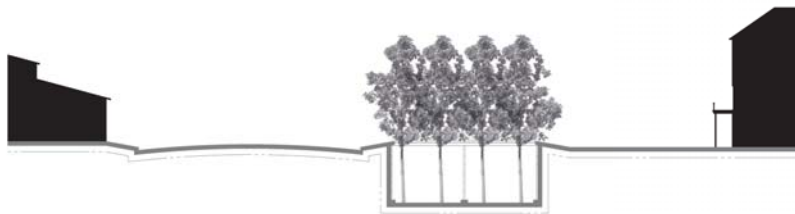
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NOT TO SCALE

identify [idea-tag]



t r a n s c e n d



1

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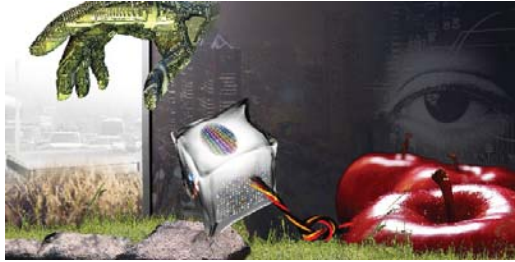
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v i s u a l i z e



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i n v i g o r a t e



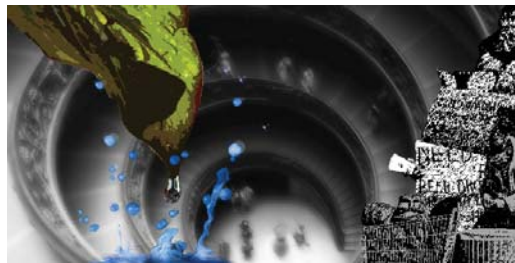
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a c c e s s



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identify [program]





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identify [program]

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identify [concept]







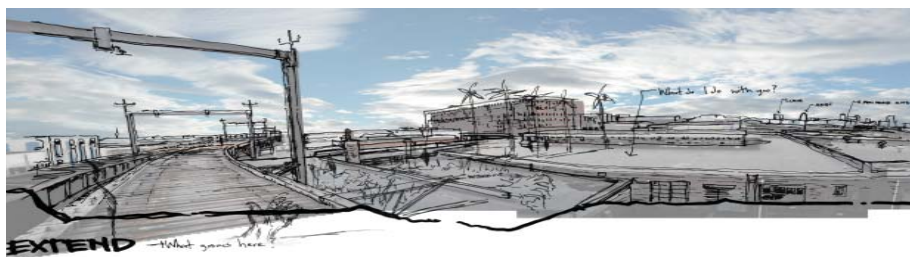
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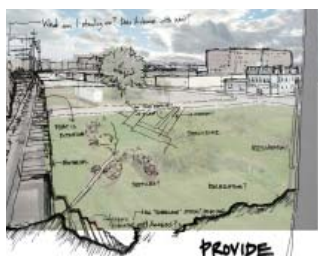
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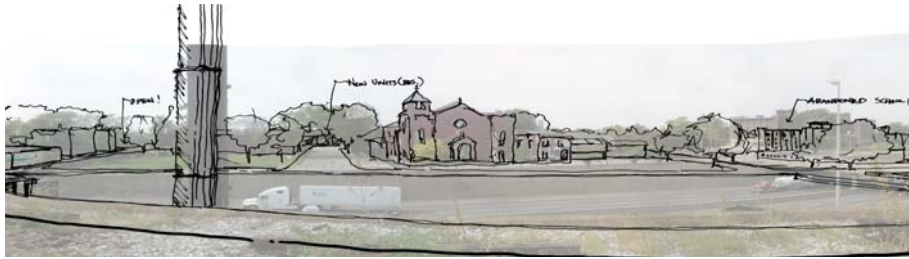
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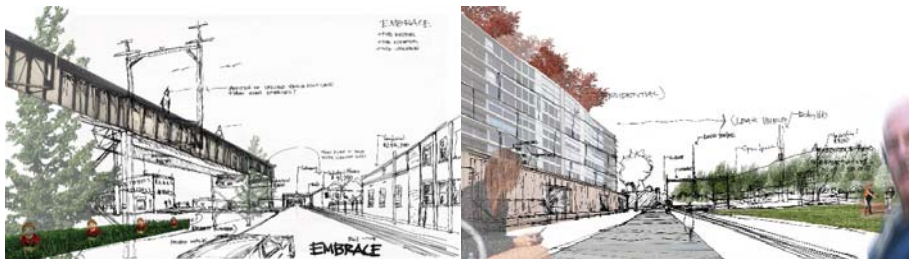




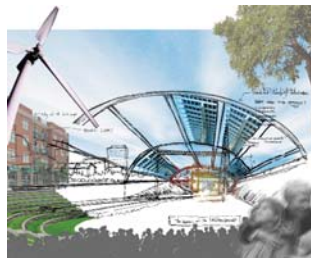
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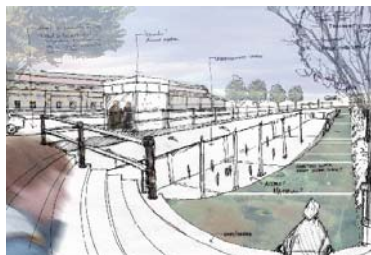
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# I N V E N T O R Y

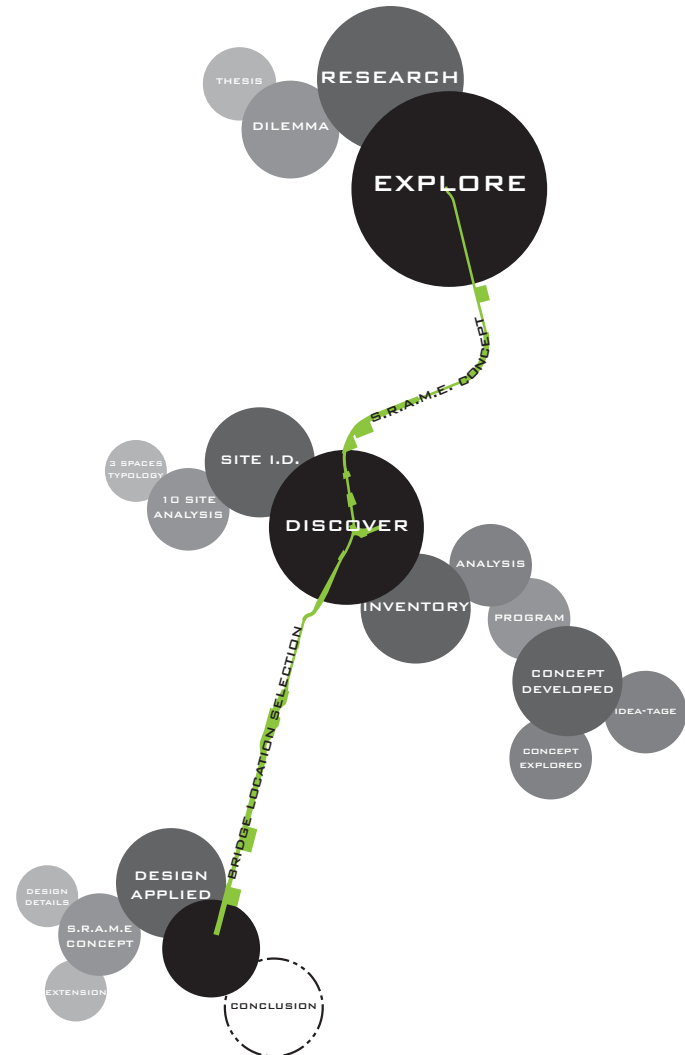


## inventory [methodology]

After visiting the site, quantitative and qualitative information is observed, gathered, and translated into diagrammatic understanding. Site boundaries are established, the Trestle line is located, and individual site locating is initiated.

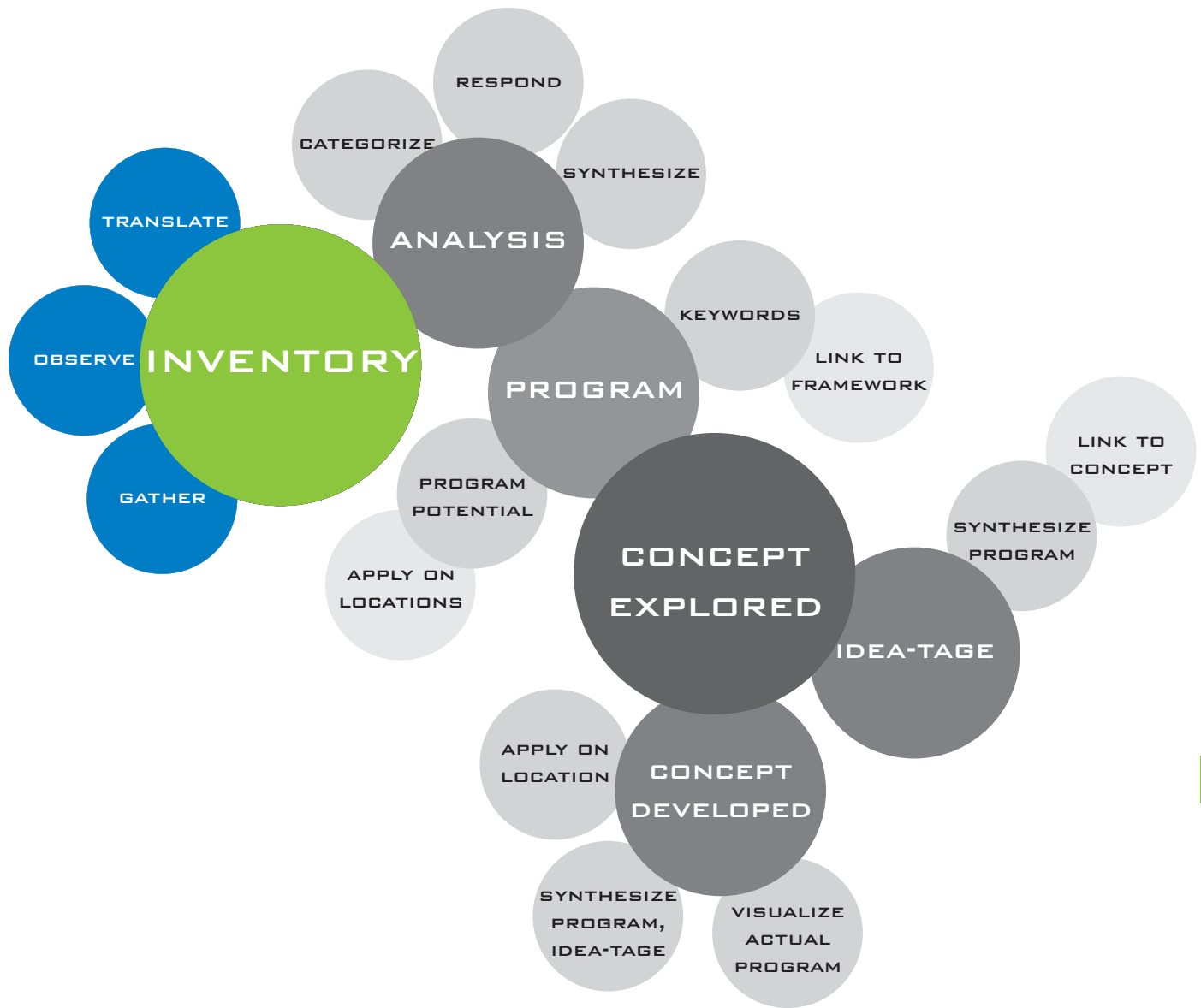
### process philosophy

The inventory phase of the *discover* process works in tandem with analysis and program to determine appropriate application of the S.R.A.M.E. Strategy. Initial observations can be changed as site understanding develops throughout the design process. Locating the boundaries early allows for the establishment of detailed boundaries for individual sites, again able to be refined throughout the design process.



f 3.1a design process: a methodology applied. illustration created by designer 2009





The Iron Horse Trestle links to the 2007 renovated Branch Street Trestle portion. Offset from the existing rail line, there exists a current plaza space complete with ornamental bollards, paved parking to the Riverfront Trail pedestrian trail system, and asphalt paved path paralleling the Mississippi River.

Traveling south starting at ground level, the rail begins an upward ascent through existing scrub vegetation. Bordering a working riverfront to the east and industrial recycling factories to the west, the *gateway* has the potential to become an iconic point for visitors to the trail.

The Trestle emerges from rail on grade to an extended wooden elevated deck continuing southward towards site 2 (elevated working riverfront). Several catenaries exist on site with electrical lines removed. No paved path exists linking pedestrians to the elevated rail although it is possible to find human created paths.

The existing wooden structure is rotting and must be replaced. The concrete supports can still be utilized but the scrub vegetation emerging through the seams of the Trestle must be examined for potential impact.

### **potential to apply the s.r.a.m.e. strategy**

Embedded sensory mechanisms can be laid at any point on or within the Trestle tracks following structural examination. Responsive, adaptive, or mutative qualities will be based upon frequency and intensity of use. Primary consideration seems to be in identification and branding potential although if trail was used for specific events, wearable technology could be applied.

The physical and visual connection to the existing Branch Street Trestle renovation, placement and alignment with Riverfront Trail, and opportunity in engaging the industrial district will be the significant factors to consider for the success of a future emergent mechanism.

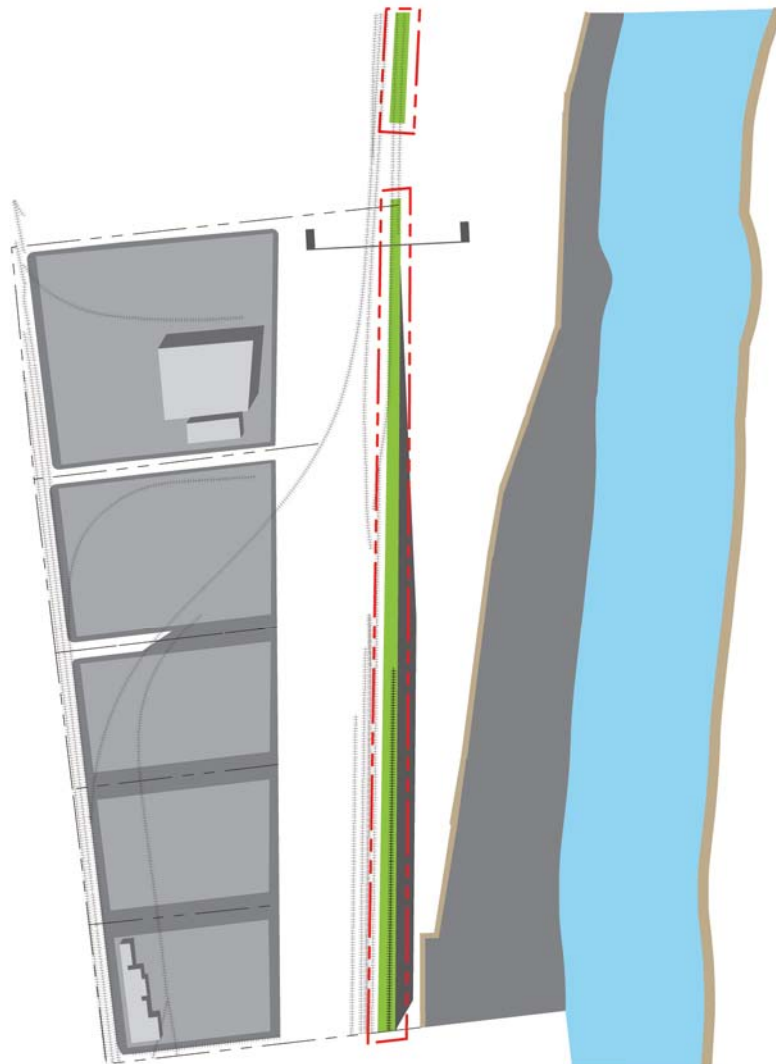


f 3.2a location plan: inventory of site one. illustration created by designer 2008





f 3.2b site imagery: inventory of site one. photography by designer 2008



f 3.2c site plan: inventory of site one. illustration created by designer 2008

- inventory legend**
- - - - - Boundary
  - Trestle
  - River
  - - - - - Centerline
  - Parcel
  - R.O.W.
  - Building
  - Tree outside Boundary
  - Tree within Boundary

Located along the flood wall paralleling the Mississippi River and bordering recycling yards, industrial machinery and truck equipment, and high above existing grade, the *elevated working riverfront* transforms from wooden structure into a steel-wood mix. The wood is badly degraded and requires either removal or replacement. Emergent plant life sprouts through the crevices of the Trestle.

The Trestle portion along the riverfront lies within structural type one (elevated). There are several height constraints and safety issues that must be addressed in future designs. There is a wide gap between the edge of the Trestle and the edge of the flood wall. Is there potential benefit in extending the Trestle to engage the riverfront? How can the working industrial quarter and especially the recycling facilities actively participate in the formation of the public open space system?

Site two has very few to no residences although trail usage has increased, especially following the construction of the Branch Street Trestle. A connective mechanism to the existing Riverfront Trail would be beneficial. Easy accessibility would be valuable in establishing presence along the path.

### **potential to apply the s.r.a.m.e. strategy**

Embedded sensory mechanisms can be laid at any point on or within the Trestle tracks following structural examination. Responsive, adaptive, or mutative qualities will be based on frequency and intensity of use. Primary consideration must focus on safety issues due to height and distance from existing infrastructure.

The physical and visual connection to the existing Branch Street Trestle renovation, placement and alignment with Riverfront Trail, and opportunity in engaging the industrial district will be significant factors to further consider. Adaptive landscapes or interpretive stations along the trail could provide trail heads or nodes. Taking advantage of the existing catenary system, inserting sustainable energy technology that typically are not possible or implemented at street level, and extending pedestrian trail systems can also be engaging opportunities.



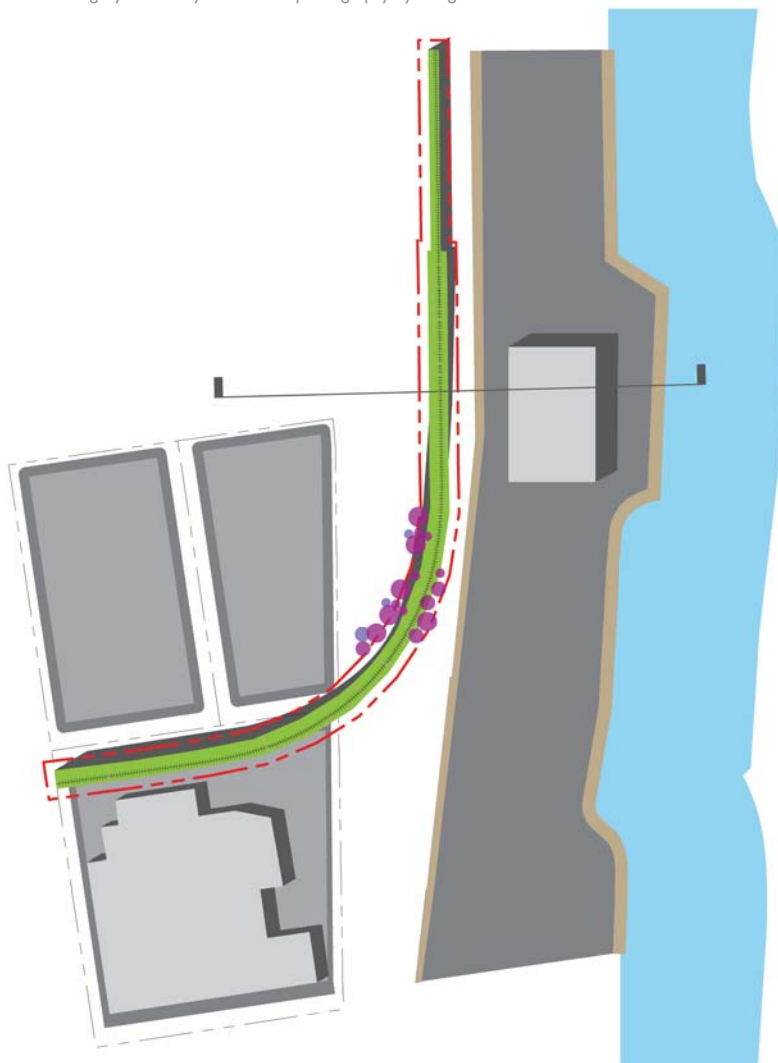
f 3.3a location plan: inventory of site two, illustration created by designer 2008







f 3.3b site imagery: inventory of site two. photography by designer 2008



f 3.3c site plan: inventory of site two. illustration created by designer 2008



- inventory legend**
- Boundary
  - Trestle
  - River
  - Centerline
  - Parcel
  - R.O.W.
  - Building
  - Tree outside Boundary
  - Tree within Boundary

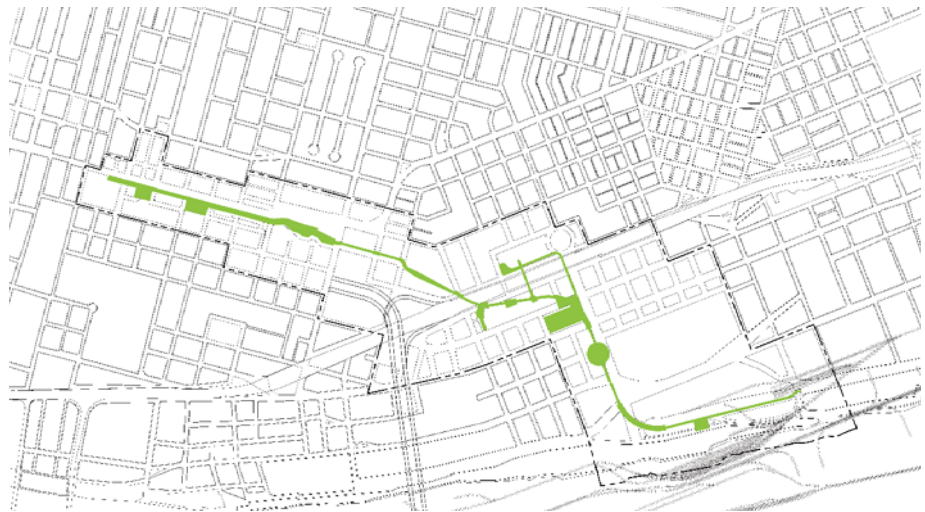
## inventory [site 3: elevated industrial quarter]

Located high above ad hoc parking lots for industrial workers, site three, *elevated industrial quarter* contains some of the most prolific views and vistas of the city. Vantage points to the Arch reveal and disappear through building structures. Primary to facilitate use will be issues related to access. Stairs, ramps, and elevators to allow accessible entrance must be implemented. Prior to abandonment, the Broadway Street Terminal provided an access station for passengers on the interurban.

Produce Row formerly served as a residential market place. Today, the site is heavily used especially for early morning truck deliveries. Can visitors take advantage of the views and underutilized space below the Trestle? Air and property rights can be considered as the majority of the space below the rail does not belong to the city.

### **potential to apply the s.r.a.m.e. strategy**

Embedded sensory mechanisms can be laid at any point on or within the Trestle tracks following structural examination. Responsive, adaptive, or mutative qualities will be based on frequency and intensity of use. Primary consideration must focus on safety issues due to height and distance from existing infrastructure.

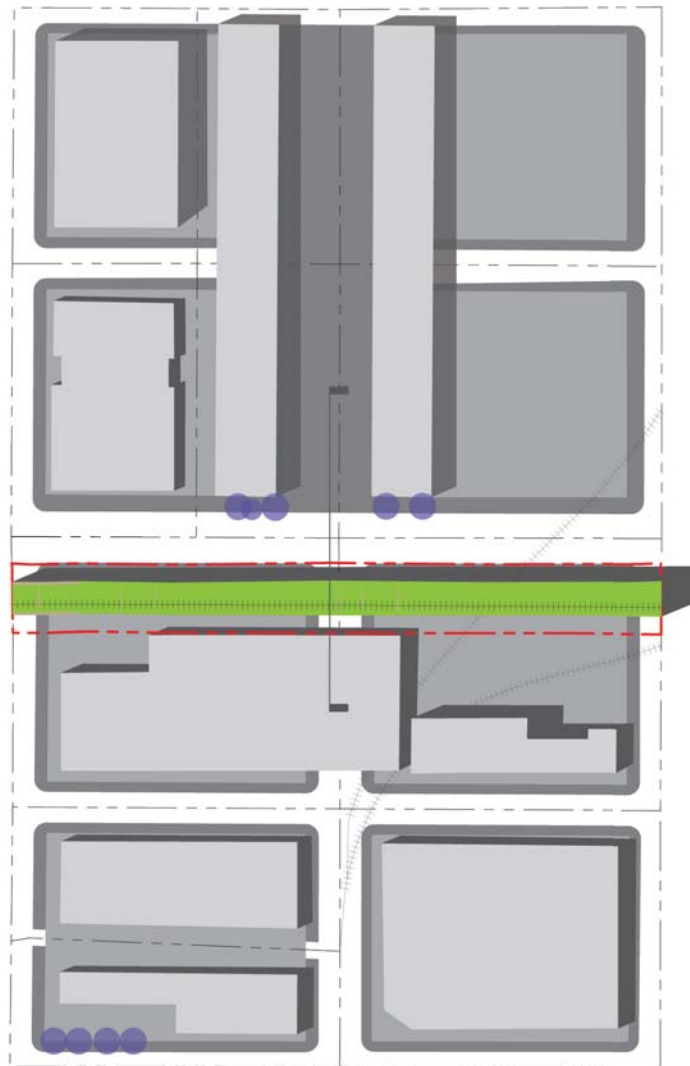


f 3.4a location plan: inventory of site three. illustration created by designer 2008

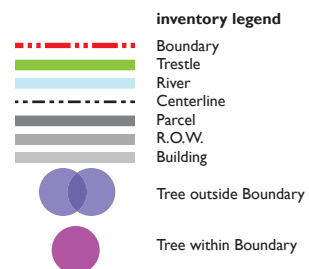




f 3.4b site imagery: inventory of site three. photography by designer 2008



f 3.4c site plan: inventory of site three. illustration created by designer 2008



Rounding the curve of the Trestle lies site four, *elevated commercial district*. The Trestle remains elevated throughout, paralleling Market Street, passing over and moving south paralleling Broadway and Interstate 70. The portions moves through a highly active commercial-light industrial district, although some structures appear abandoned or neglected.

The close proximity of the building rooftops holds the most significance for extending Trestle usage. Coordinating with business owners and allowing for proactive participation from the commercial district will enable a more successful partnership. The Trestle line makes a unique connection into and in close proximity to several commercial structures.

Highly visible to vehicular transportation along Market and Broadway, the Trestle's visual impact and view sheds south to downtown offers significant vantage points. Access will be crucial in establishing presence along the rail.

A pedestrian bridge lies isolated over the interstate and can be incorporated into the Trestle's extension west towards Franklin Park and the currently gentrifying portion of Market Street. The open space link could be enhanced by extending Trestle lines throughout structures, creating a mixed use residential-commercial frontage, and incorporating existing buildings.

#### **potential to apply the s.r.a.m.e. strategy**

Embedded sensory mechanism can be placed along revitalized Trestle structures. Media walls along highly trafficked areas can be beneficial in establishing identity as well as gathering information. Extendable platforms that can convert into various programs as necessary provide responsive and adaptive technology, as well as functional accessibility. With increased usage the Trestle can mutate from stagnant structure into dynamic catalytic open space. Use can enable an emergent residential landscape into what is typically a commercial-industrial district east of the interstate.



f 3.5a location plan: inventory of site four. illustration created by designer 2008







f 3.5b site imagery: inventory of site four. photography by designer 2008



f 3.5c site plan: inventory of site four. illustration created by designer 2008



- inventory legend**
- - - - - Boundary
  - Trestle
  - River
  - - - - - Centerline
  - Parcel
  - R.O.W.
  - Building
  - Tree outside Boundary
  - Tree within Boundary

## inventory [site 5: open space below elevated]

Extending southward from the commercial district and north from the bridge lies site five, *open space below elevated*. The rail parallels the interstate on the west and unused open space lots to the east. The area is heavily trafficked as a transition point from the interstate as the streets paralleling I-70 are one-way and the main ramps to reach the Fifth Ward.

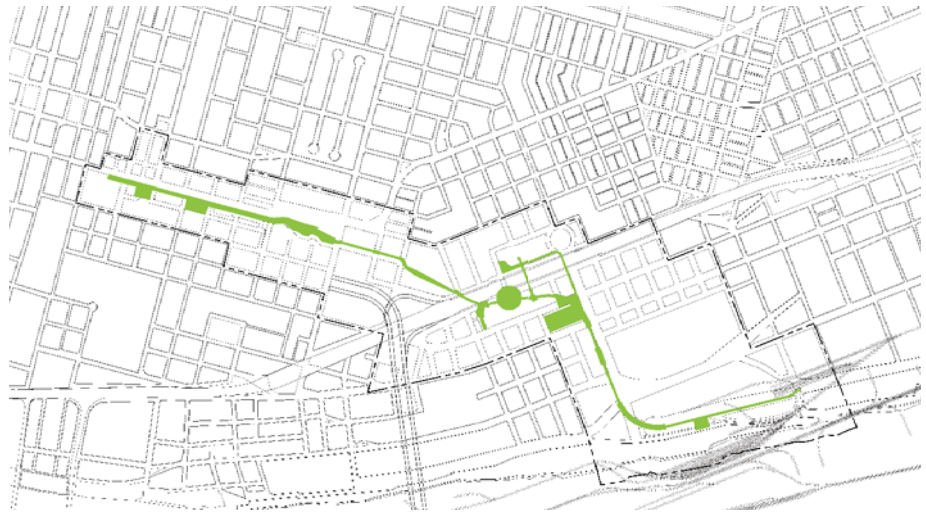
Several neglected and degraded structures exist on or in close proximity to site five. Existing structures can be incorporated into the Trestle's extension. With unblocked views towards downtown, the Trestle's vantage points offer wide angle opportunities.

Site five faces an abandoned educational institution across the interstate. Incorporating educational opportunities can evolve to further involve the community members, linking the Trestle to the neighborhood system.

### **potential to apply the s.r.a.m.e. strategy**

Access onto site five and safety provisions due to proximity to roadways must be considered. Extending platforms, stairs, seating, and railing will be dependent on ability to access the Trestle. As the largest space of green space within the site boundaries, reducing street infrastructure and increasing public open space acreage can prove beneficial by creating a larger, emergent landscape.

Structural additions can also prove beneficial as an adaptive or mutative mechanism, enabling future emergent growth of residential and business opportunities through the district.

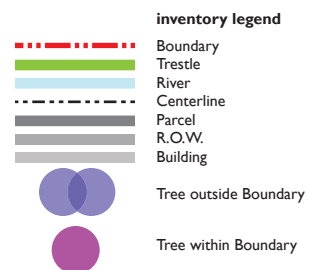


f 3.6a location plan: inventory of site five. illustration created by designer 2008





f 3.6b site imagery: inventory of site five. photography by designer 2008



f 3.6c site plan: inventory of site five. illustration created by designer 2008



Crossing Interstate 70 east-west is site six, *the bridge*. Elevated approximately 20' above vehicular traffic with distinct and unobstructed views to downtown and the Arch, the bridge is the most significant visual identifier of the Trestle. Highway traffic, visitors, and passer-by's will encounter the bridge first when moving into or through St. Louis. The bridge is key to creating an identity for the Trestle.

Structurally sound, the bridge does not contain any wooden tracks and thus does not need replacement of platforms. Safety considerations for traffic must be considered. Existing railing over the interstate portion provides safety cushion.

#### **potential to apply the s.r.a.m.e. strategy**

As a highly visible access point, the inclusion of sensory digital and physical mechanisms can enable increased interactivity with the structure. Capping the bridge can create a physical link across the highway. Accessible stairs, elevators, and ramps enables usage into and through the site. By creating a prolific, iconic point along the Trestle, the bridge can enable the creation of emergent systems, specifically renewed residential districts further south and west within the neighborhood areas.



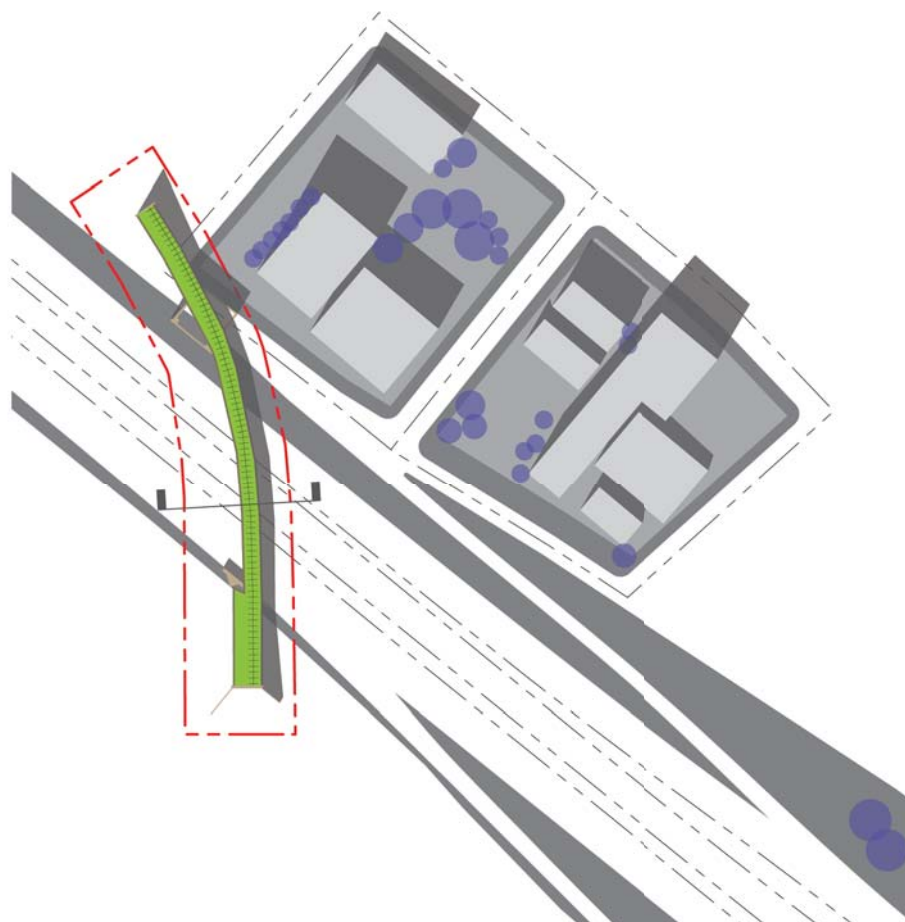
f 3.7a location plan: inventory of site six. illustration created by designer 2008







f 3.7b site imagery: inventory of site six. photography by designer 2008



f 3.7c site plan: inventory of site six. illustration created by designer 2008



- inventory legend**
- Boundary
  - Trestle
  - River
  - Centerline
  - Parcel
  - R.O.W.
  - Building
  - Tree outside Boundary
  - Tree within Boundary

## inventory [site 7: elevated to ground transition]

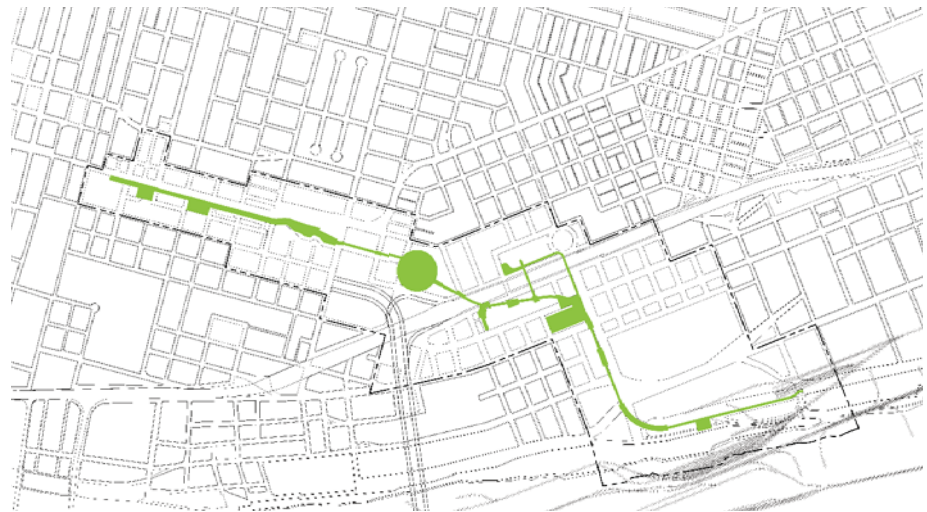
Extending from the bridge and making the transition from elevated portion to ground level trackage is site seven, *elevated to ground transition*. Site seven currently exists either without visible structural platforms or on decaying structure. Catenaries provide a footprint for the platform and suggest the previous Trestle alignment.

Most prevalent is the existence of scrub vegetation that has emerged as the dominant landscape. To the west are commercial and residential structures directly abutting each other. Prior to the construction of the Trestle, site seven had been a mixed-use residential district for the working class and immigrants. The Trestle eradicated residences and introduced a commercial presence that leads to a vacant and neglected character. Vestiges of industrial remnants remain as do several underutilized buildings and mechanical equipment.

### **potential to apply the s.r.a.m.e. strategy**

Safety, lighting, and street exposure must be addressed in order to enable use of the Trestle's transitioning ground level trackage. A modular responsive structural platform could help in creating movement through the whole portion of the Trestle. Eliminating the existing grade crossings part of the original construction of the Trestle was originally constructed could be created to both visually identify as well as make the path accessible and usable.

The numerous industrial remnants could be incorporated into future design solutions, emerging as structural adaptations for housing, commercial, or reintroduced industrial functions. As another large portion of green space, urban agriculture or rapidly renewable resources could be interjected within site seven.

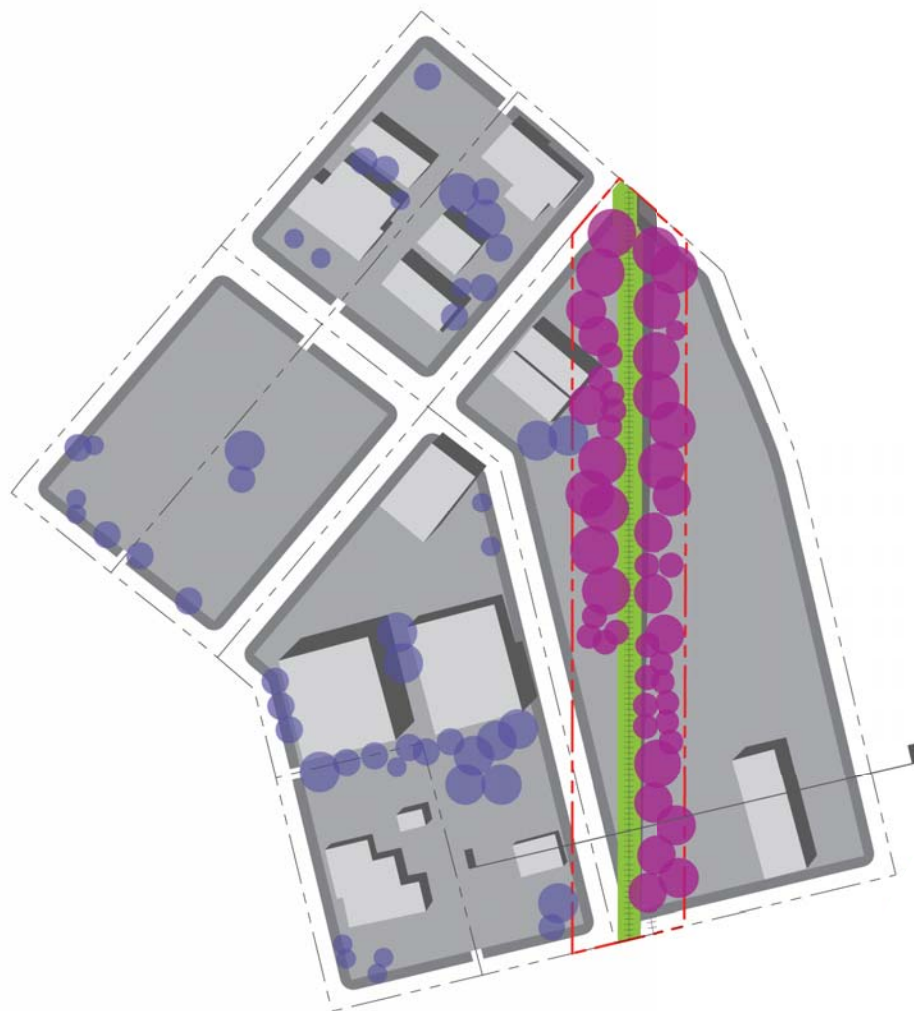


f 3.8a location plan: inventory of site seven. illustration created by designer 2008

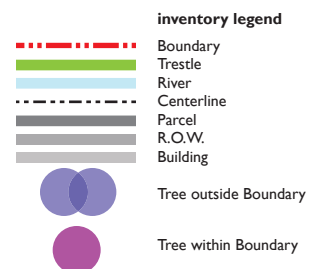




f 3.8b site imagery: inventory of site seven. photography by designer 2008



f 3.8c site plan: inventory of site seven. illustration created by designer 2008



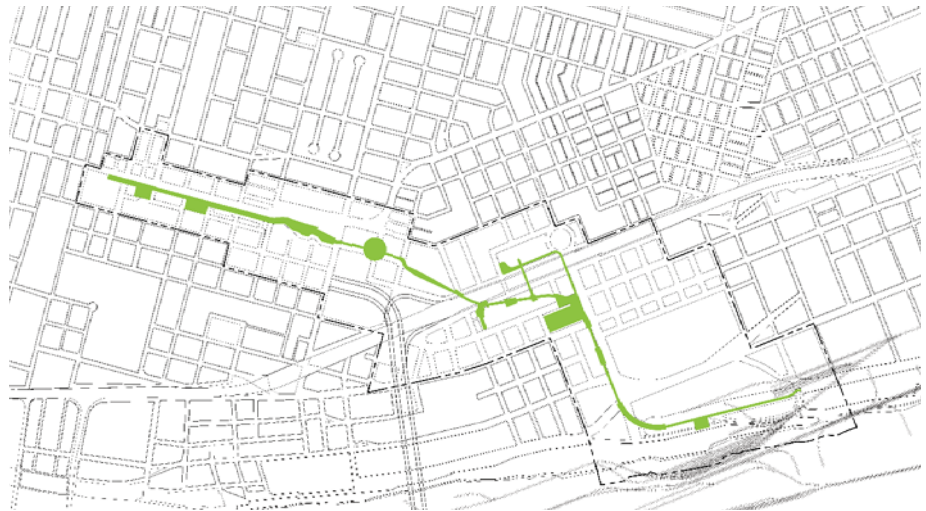
Spanning three city blocks are the only street level tracks of the Trestle. Although originally intended to be entirely elevated until moving into a subway system, value engineering determined a cost-effective method to run street level tracks south towards the subway entrance. Several commercial structures emerge as lifeless and appear underutilized.

The current construction of a new ramp and bridge system paralleling site eight leads needs to be considered in future proposals. An existing Greyhound bus depot must remain on site but the majority of the structures are either abandoned or home to transient populations.

Several open lots exist on site as former industrial buildings have been recently demolished.

#### **potential to apply the s.r.a.m.e. strategy**

A visual presence for the Trestle needs to be considered in order to create an effective identity. Ramps, stairs, and elevators can be incorporated within. The adaptive reuse of abandoned Trestle pieces, such as remnants from the Venice High Line, can be incorporated as part of the Trestle. Open spaces have the potential to serve as multiple fronts. Mixed-use districts could facilitate successful residential introduction. Open spaces at ground level could create a physical green space connection south to downtown.



f 3.9a location plan: inventory of site eight. illustration created by designer 2008







f 3.9b site imagery: inventory of site eight. photography by designer 2008



f 3.9c site plan: inventory of site eight. illustration created by designer 2008



- inventory legend**
- Boundary
  - Trestle
  - River
  - Centerline
  - Parcel
  - R.O.W.
  - Building
  - Tree outside Boundary
  - Tree within Boundary

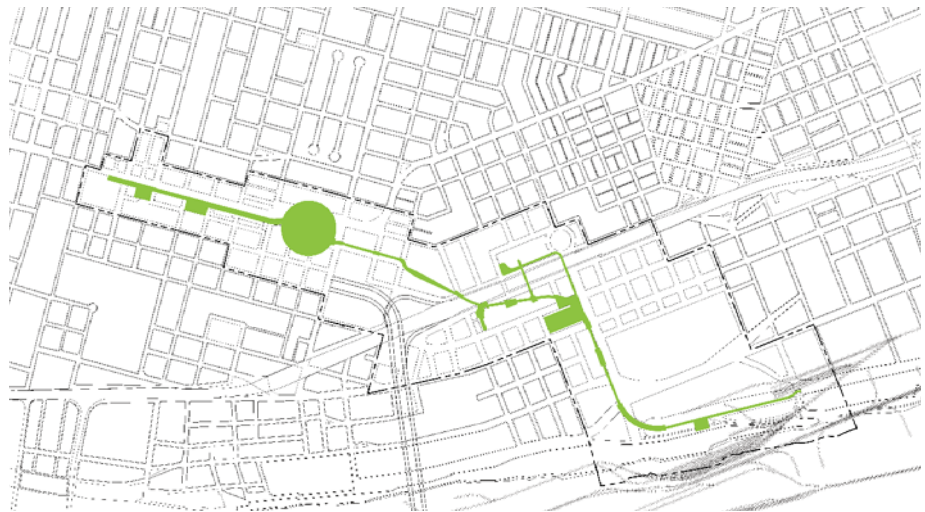
Highly enclosed, site nine, *subway transition entrance*, is home to a transient population. West of an empty parking lot and north of revitalized low-income housing, site nine is at a crucial intersection between renewed and abandoned. The new highway addition shows plans to cap the subway system to make way for a suburban-esque roundabout within a downtown urban system. However, this would close the subway to any future use.

The homeless population is prevalent in and in close proximity to the subway. Gentrified structures and districts would drive the population out but would not solve transient population issues. Enabling active participation from the community can be beneficial in establishing character and need for the subway entrance area.

#### **potential to apply the s.r.a.m.e. strategy**

Reestablishing the urban street grid is key to circulation. Emerging residential districts could incorporate the Trestle as a 'backyard park' system. Making the history of the Trestle present could be beneficial within a museum or civic institution.

Sensory mechanism could indicate pedestrian presence and usage. The emergence of a responsive and safe structure could enable future growth and use. A responsive landscape could then adapt over time emerging from the current relatively enclosed concrete walls and into the parking lot. Street presence and visibility will enable the highest amount of use.

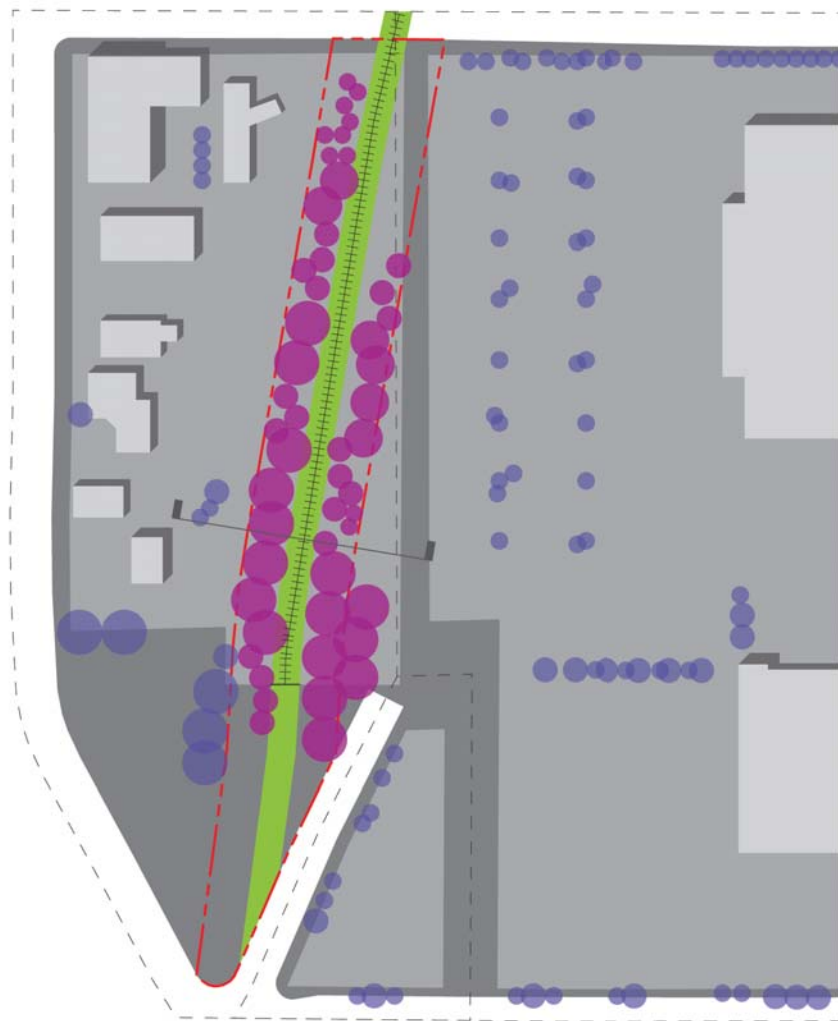


f 3.10a location plan: inventory of site nine. illustration created by designer 2008

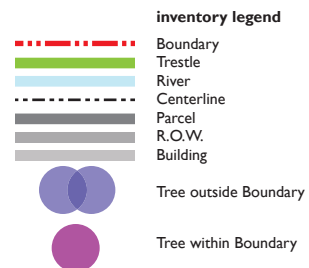




f 3.10b site imagery: inventory of site nine, photography by designer 2008



f 3.10c site plan: inventory of site nine, illustration created by designer 2008



## inventory [site 10: underground subway-street extension]

Extending south from the subway entrance is site ten, *underground subway-street extension*. Enclosed and invisible to street level - especially with the closing of 12th Street/Florissant south between Cole and O'Fallon - the subway extends underground towards the original depot below the Midwest Terminal Building.

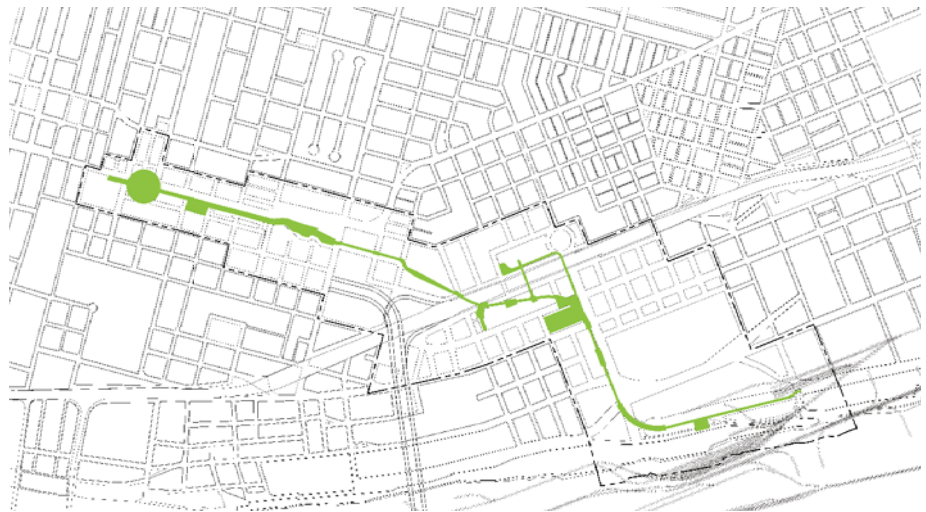
Vegetation from below grade ventilation points emerges and prevents clear visibility down into subway. Currently, the street above the subway is structurally unsound and was recently walled off to prevent further failure. Railings along the edge of pedestrian walks mark the street level presence of the subway.

Current transient populations enter the subway system through open links within site ten. Self-created fires during winter months lead to unsafe underground ventilation safety issues. Directly abutting the subway extension are several revitalized or currently being constructed low-income housing districts. As the subway passes Cole, the character changes from residential to urban downtown structure.

The Trestle passes under a paved parking lot, the Globe Democrat newspaper building, and last visible at street level under the Martin Luther King Plaza. High concrete enclosures prevent accessibility into the subway portion as does constant use of the plaza as a transient population area.

### **potential to apply the s.r.a.m.e. strategy**

Exposure to street level would lead to realization that a subway system exists. Preventing street failure is necessary in order to retain function of the system. Accessible ramps, stairs, and elevators emerging from below ground could lead to a unique pedestrian experience similar to the underground train stations of Europe. Safety considerations will be key factors in determining success. Establishing street identity, visibility, and character will make the Trestle's presence known but use will come if the area's image changes. Sensory monitors and responsive mechanism for seating, platforms, and paving could create a unique district to create an interconnected open space system linking the disparate and separated North St. Louis to downtown.



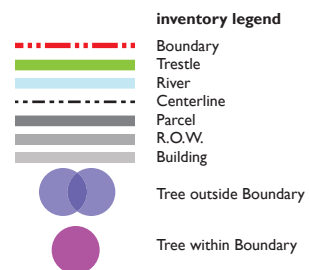




f 3.11 b site imagery: inventory of site ten. photography by designer 2008



f 3.11 c site plan: inventory of site ten. illustration created by designer 2008



## inventory [conclusions]

The identification of three unique structural character types can lead to the creation of ten distinct sites. Each individual site's ability to apply the S.R.A.M.E. Strategy (sense, respond, adapt, mutate, and emerge) will be instrumental in creating unique experiences. However, most significant will be the link that must emerge to create an interconnected system. If only select sites are successful, then the disparate condition of the current open space system - notably neglected pocket parks, under-designed open spaces, single-program green lots - will again emerge and the future of a linked open space system may be lost.

The rejuvenation of the Branch Street Trestle portion north and east across McKinley Bridge has connected Missouri to Illinois. By revitalizing the Missouri portion to extend the open space link through the city, a renewed public open space link can catalyze surrounding area developments, connect downtown to its discarded northern counter, and serve as ideal for future park design. Incorporating the existing context and enabling design decisions that are fueled by the actual users creates a more wholistic, inclusive solution emerge. Managing social displacement and gentrification, providing design within the cultural context, and expanding the character of St. Louis can enable a successful future for a revitalized open space.







# A N A L Y S I S

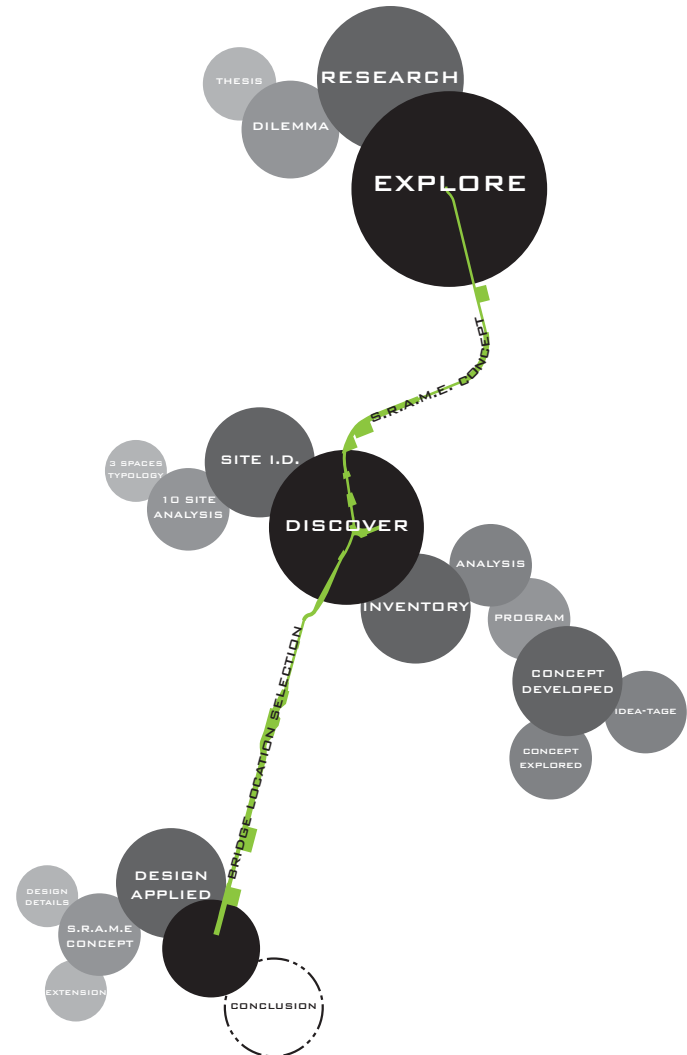


## analysis [methodology]

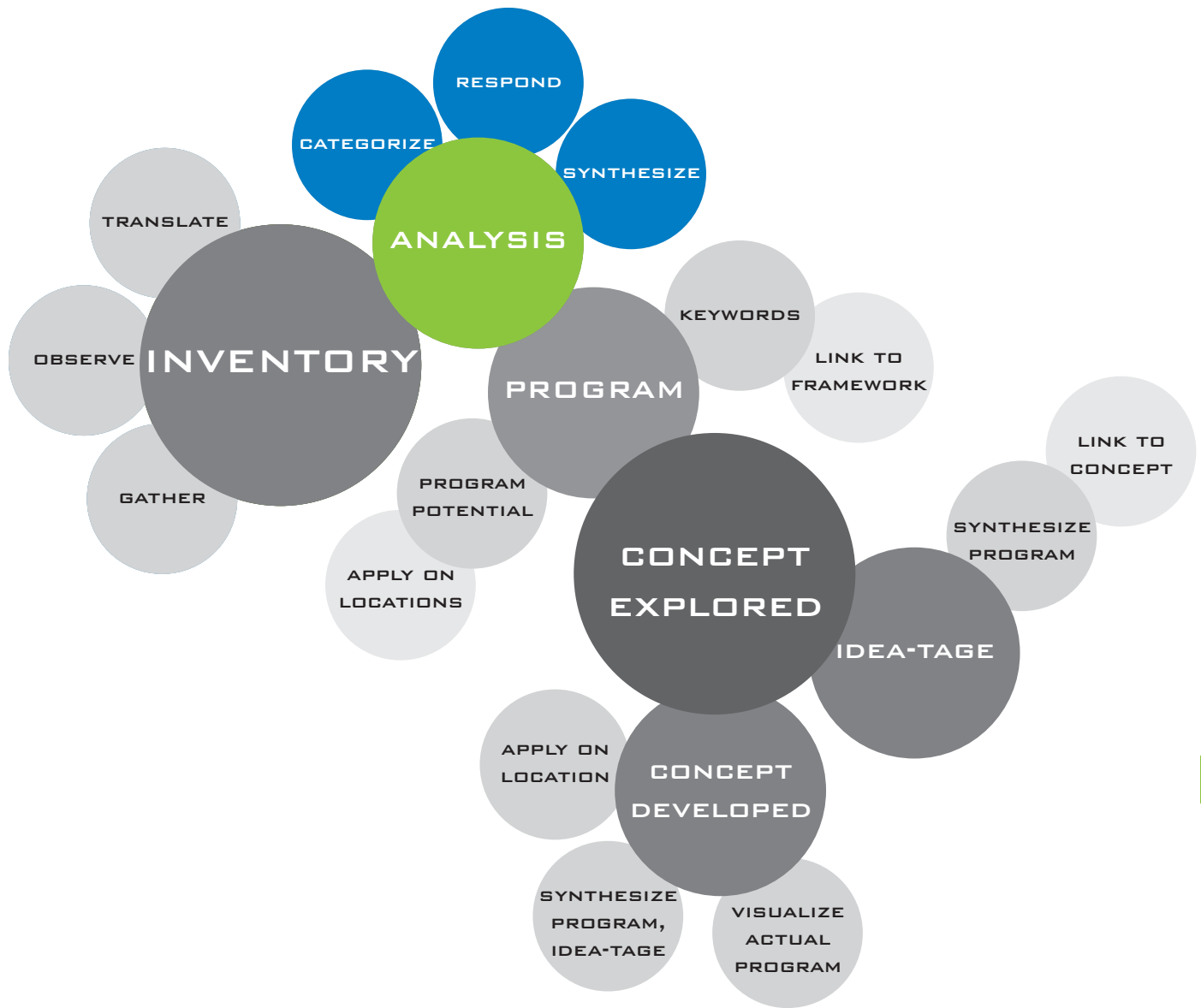
With ten individual sites identified along the Trestle's three structural types, translated site data from the inventory phase of the *discover* process is synthesized and analyzed. Sites are categorized based on a five-characteristic system focusing on qualitative responses to *enclosure, light, visibility, and elevation*. Elicited responses lead to synthesis of the individual site and color-rated as either high (magenta), medium (blue), or low level (green) of issues-constraints. The color-rating provides an inverse relationship between issues-constraints and potential for revitalization; the higher the constraints, the lower the potential for revitalization.

### process philosophy

The analysis phase of the *discover* process works in tandem with inventory and program to determine appropriate application of the S.R.A.M.E. Strategy. Synthesized results form the future design basis; the higher the constraints, the higher the revitalization efforts.



f 3.12a design process: a methodology applied. illustration created by designer 2009



### enclosure

The site is at a close level to grade coupled with surrounding river wall. There is a lack of rail support that must be mediated. There is stable ground below the Trestle and low slope ascent movement through Trestle.

### light

No night lighting is present. There is a sufficient amount of daylight allowing full views in, out, and through site.

### visibility

Full views throughout though highly hidden from street or pedestrian activity common.

### elevation

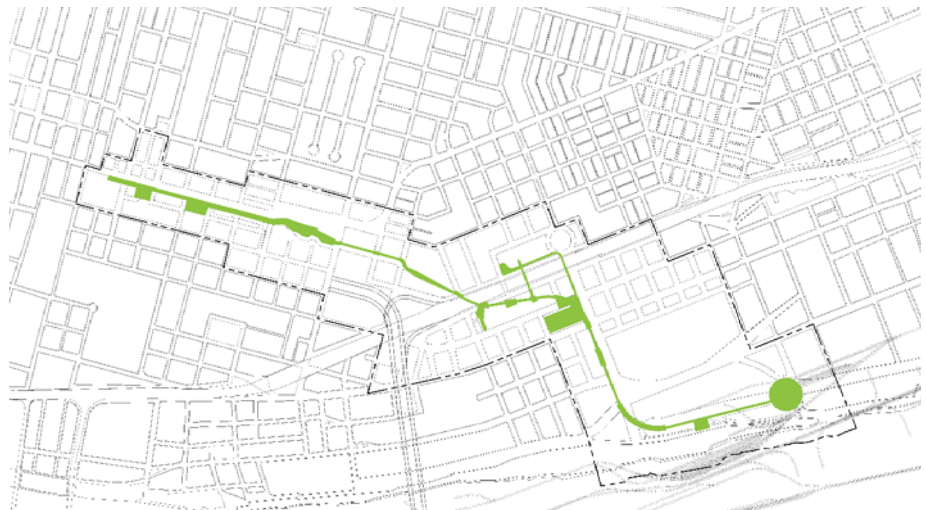
Low slope ascent to reach Trestle. Merges to grade when adjoining Branch Street Trestle.

### quality of surroundings

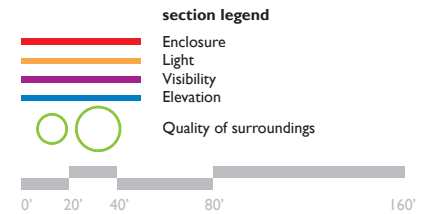
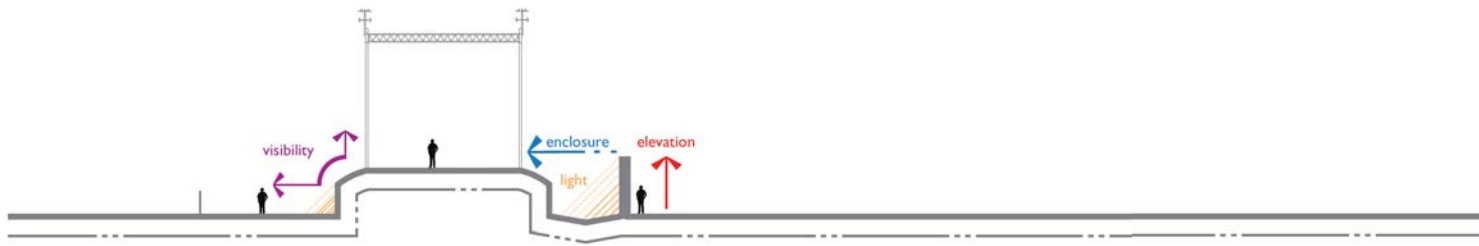
Branch Street Trestle to north is improved. Lacks connection and link to Iron Horse Trestle/ Emerging scrub vegetation creates an unmaintained character appearance.

### capability in applying the s.r.am.e. strategy

In order to make functional, access and connection with existing Trestle must be considered. In order to increase safety and security, night light and security through visibility by people must be introduced. In order to make pleasurable, site must offer usable amenities and reason for destination. In order to visualize potential site design options, make physical connection between existing revitalized Branch Street Trestle to north and the Iron Horse Trestle to south, include entertainment points for pleasure, incorporate existing river, act as gateway and identifying point for entering system.







ENCLOSURE

L I G H T

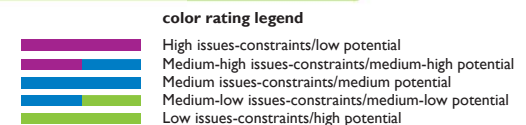
V I S I B I L I T Y

ELEVATION

Q U A L I T Y

Adequate provisions, access to prime views at moderate level elevation and good surroundings suggests  
**SAFE, FUNCTIONAL, VISUALLY AND PHYSICALLY PLEASURABLE ENVIRONMENT**

Light introduction and improvements to existing infrastructure could suggest  
**POTENTIALLY ENHANCED ENVIRONMENT**



### enclosure

Wood rail deteriorating. No hand rails for support. Lack of building mass, open air surrounds.

### light

Night light from street adequate. Daylight uncontested allowing unobstructed views.

### visibility

Rail portion within highly industrial section with lack of residents. Views directed towards river and industrial character. Faintly visible but typically unnoticeable from street.

### elevation

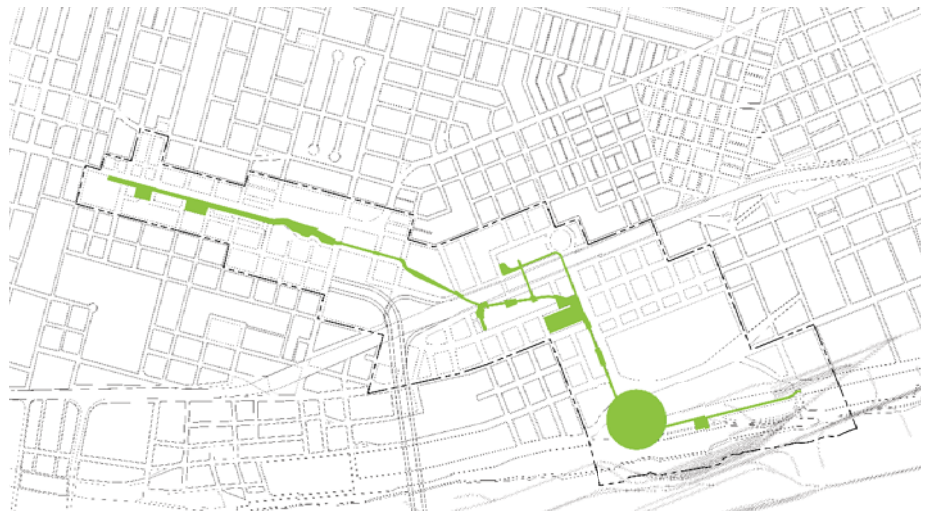
Highest points reached when rounding curve near river and close to Produce Row. Spacing between planks widens as wood rail becomes shorter.

### quality of surroundings

Creeping vegetation suggests potential emergent quality yet also demands replacement of wood ties and steel rail. Very industrial, warehouse character.

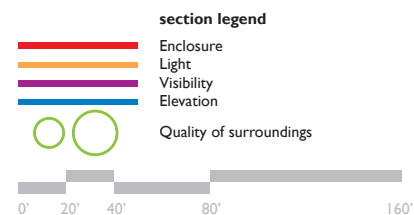
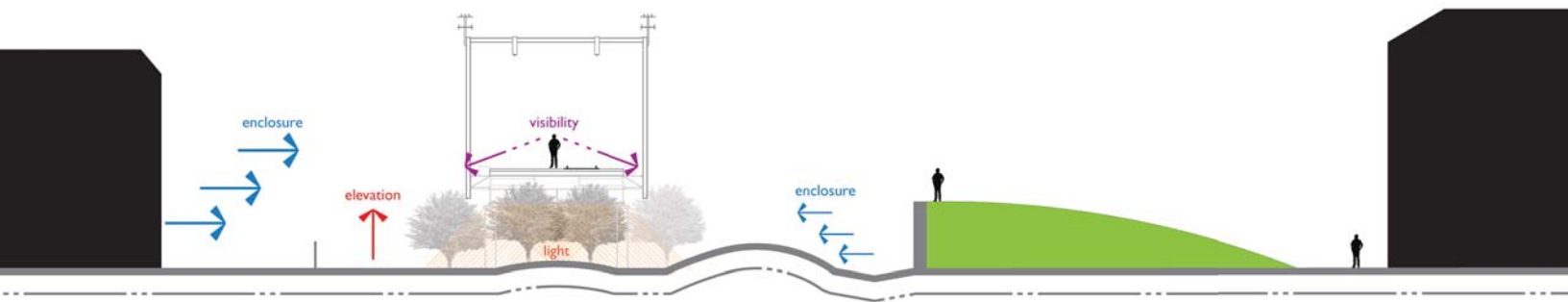
### capability in applying the s.r.am.e. strategy

In order to make functional, rail must be replaced, vegetation needs to be mediated, and access must be made to Trestle level. In order to increase safety and security, light at Trestle level, side supports, and increased community presence need to be introduced. In order to make pleasurable, destination point or trail needs to be created to facilitate movement. In order to visualize potential site design options, wood could be adaptively reused in other portions, recycling facilities could be incorporated, art exhibits could occur, rail could provide energy, interact with river, use during various times of year when river portion under-used.



f 3.14a location plan: analysis of site two. illustration created by designer 2008





enclosure

light

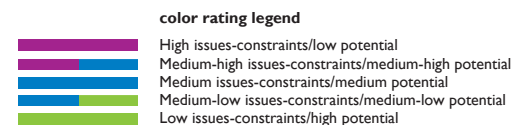
visibility

elevation

quality

Lack of enclosure, moderate visibility to street level, highest points of elevation, and surrounding quality requiring maintenance suggests  
**UNSAFE, VISUALLY UNPLEASANT ENVIRONMENT**

Emergent vegetation, industrial character, high light level, and in-place infrastructure suggests  
**POTENTIALLY SAFE, PLEASURABLE ENVIRONMENT**



## analysis [site 3: elevated industrial quarter]

### enclosure

No security rail, failing wood, narrow passage at high elevation leads to decreasing sense of security. There is a lack of people presence except for those involved in industrial area.

### light

Night light intermittent is intermittent. Highly used during daytime with minimal night presence. Except for Trestle structure, few obstructions for natural daylight exist.

### visibility

Fairly unobstructed views and vistas to exterior from top of Trestle. Lack of safety and security due to low visibility at street level.

### elevation

Narrow passage coupled with high elevation, shorter planks with longer spacing, and lack of interval landings leads to high sense of insecurity while on Trestle.

### quality of surroundings

Wood decaying rapidly through 'industrial' portion. Working riverfront and industrial portions are very active but no residents and low street presence.

### capability in applying the s.r.am.e. strategy

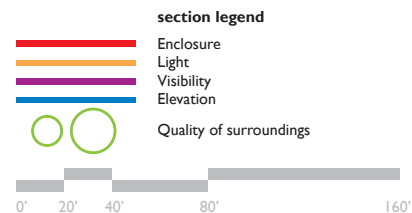
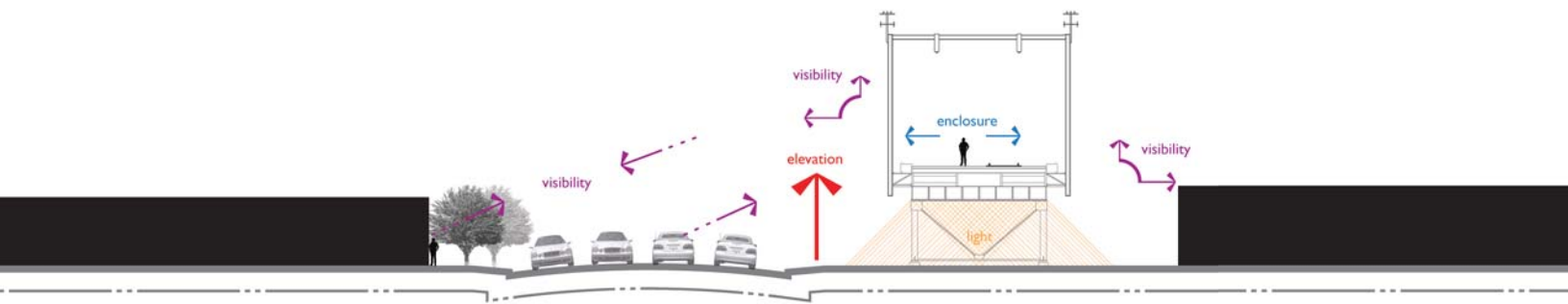
In order to make functional, material and safety concerns must be addressed, access must be a priority, integration with existing conditions is necessary. In order to increase safety and security, narrow passages could be extended, supports could be added, visual and physical separation from street could be mediated. In order to make pleasurable, site could offer potential for passive recreation, temporal events, educational or entertainment opportunity. In order to visualize potential site design options, extensions into Produce Row and industrial quarter, chance to include and impact permanent residents, stimulate the economy and add unique opportunities must be capitalized upon.



f 3.15a location plan: analysis of site three. illustration created by designer 2008







enclosure

light

visibility

elevation

quality

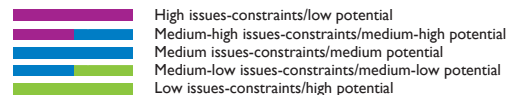
Narrow passages, lack of safety support, high elevation, lack of street presence suggests

**UNSAFE BUT FUNCTIONAL ENVIRONMENT**

Industrial character preservation, introduction of residents and amenities, unique exploitation of existing conditions suggests

**POTENTIALLY ENHANCED, PLEASURABLE ENVIRONMENT**

**color rating legend**



### enclosure

Trestle visibility from street level, higher proportion and quantity of landings, and relatively close proximity of buildings aids in feeling of safety.

### light

High night lighting in commercial area, below loading docks, and near ad hoc parking. Free daylight penetration with moderate building heights and relatively unobstructed views.

### visibility

Unrestricted views, close visibility from main streets and commercial sector below, and few obstructions aids in moderate visibility levels.

### elevation

Surrounding structures provide safe backdrop even without rail support. The 20' height above grade is mediated through the spacing of concrete landings, closer wood beam supports, and building quantity.

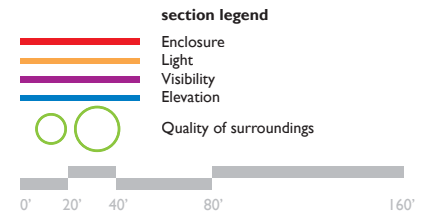
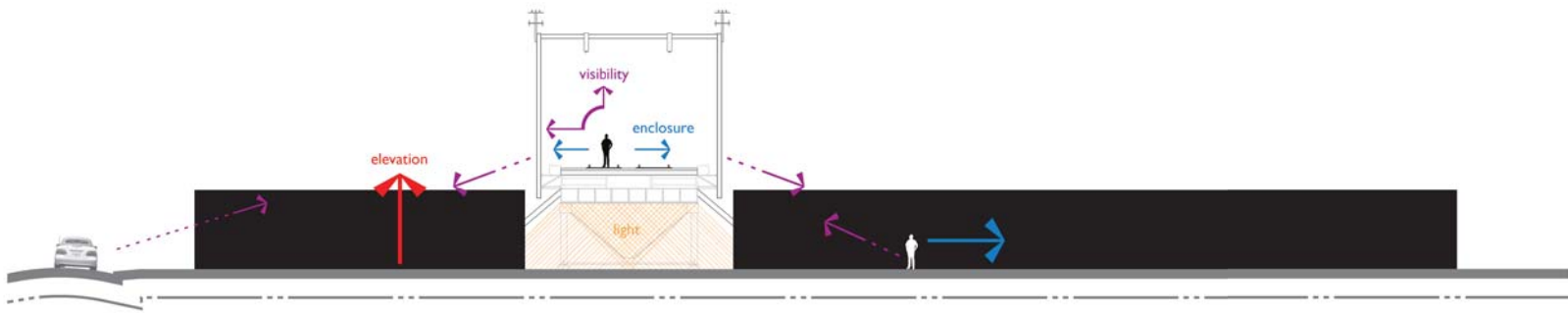
### quality of surroundings

Trestle wood rail is deteriorating. Concrete landings could be replaced.

### capability in applying the s.r.am.e. strategy

In order to make functional, wood rail needs replacement, access needs to be made apparent, commercial uses must be integrated, and people need to be made aware of Trestle. In order to increase safety and security, night lighting and patrolling would be helpful, increase residency, create walkable community. In order to make pleasurable, rail needs to be more accommodating and accessible to all types of people. In order to visualize potential site design options, underutilized buildings need to be integrated, appendages could extend outwards, and rail could widen for increased anticipated use.





enclosure

light

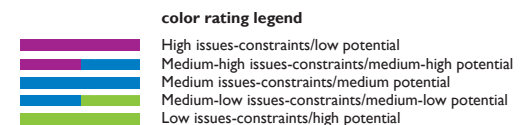
visibility

elevation

quality

Lack of rails mediated with presence of structure rooftops, lighting at street level visible at Trestle, uncircumvented views in and out, though at same height throughout the Trestle through this section seems much more secure and stable with more landing platforms along a working commercial/industrial quarter suggesting a

**POTENTIAL SAFE, PLEASURABLE ENVIRONMENT**



## analysis [site 5: open space below elevated]

### enclosure

Lack of rail to prevent falling on failing wood and steel platform. Unrestricted views out restricted access and mobility due to elevation.

### light

Lack of night lighting at street level. No light obstruction during day. Adequate for views in and out while on Trestle.

### visibility

Unconstricted views to city and visible from traffic below. No access points and high security risks can occur.

### elevation

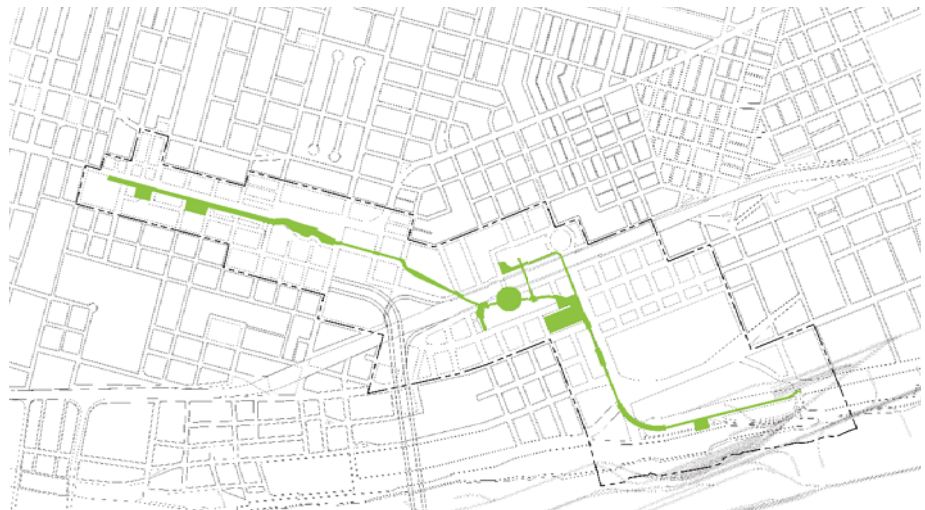
Approximately 20' above grade but close proximity to subsequent concrete landing platforms. Unstable and failing wood supports with open slits to street below visible.

### quality of surroundings

Wood requires revitalization. Majority of infrastructure is in place.

### capability in applying the s.r.am.e. strategy

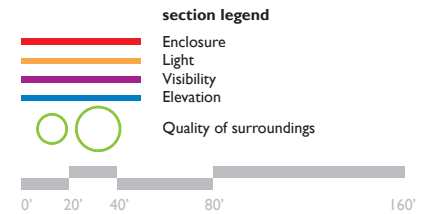
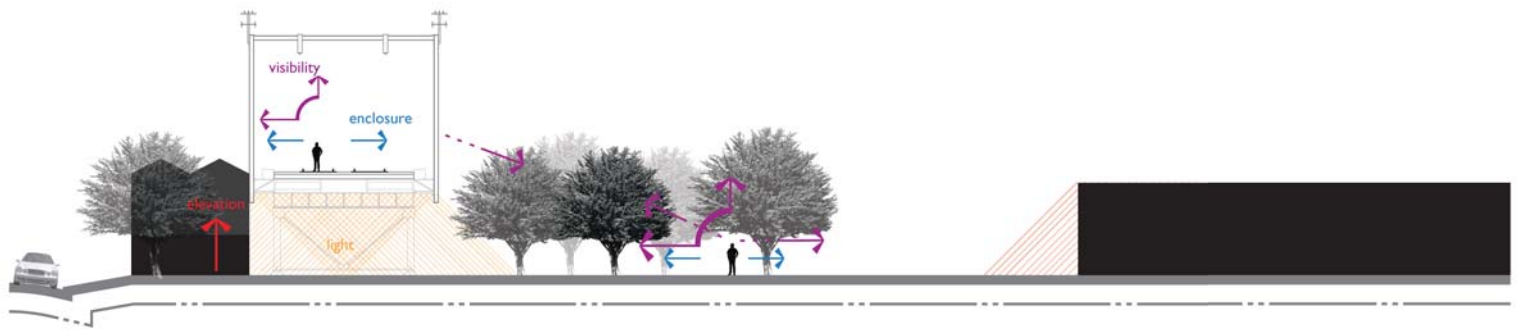
In order to make functional, access points must be added, materials must be addressed, and people need to have reason to use. In order to increase safety and security, lighting at street level, hand rails, and barriers must be placed on narrow platform. In order to make pleasurable, site must offer amenities and usable elements. View and lookouts to city, extensions into buildings or structures would be enjoyable. In order to visualize potential site design options, views and lookout points, nighttime movies and temporary events, recreational activities, resident involvement, and widened path could lead to pleasurable functional place.



f 3.17a location plan: analysis of site five. illustration created by designer







enclosure

light

visibility

elevation

quality

Lack of rail enclosures, night lighting for security, high elevation above street level, and deteriorating wood materials suggests  
**UNSAFE, UNMAINTAINED ENVIRONMENT**

Light introduction, site amenities, and unobstructed views suggests  
**POTENTIALLY PLEASURABLE, FUNCTIONAL ENVIRONMENT**

**color rating legend**

- High issues-constraints/low potential
- Medium-high issues-constraints/medium-high potential
- Medium issues-constraints/medium potential
- Medium-low issues-constraints/medium-low potential
- Low issues-constraints/high potential

### enclosure

Bridge rail provides accomodating safety ledge even with highway traffic below. High level of noise but highly visible to passing traffic.

### light

Though without significant night lighting, street level provides ambient night light. During day site is open to full sun with potential for solar energy due to south aspect.

### visibility

Unrestricted views to city and visible from traffic below.

### elevation

Although above busy interstate approximately 20' above ground, bridge safety enforced is by hand rails and column support.

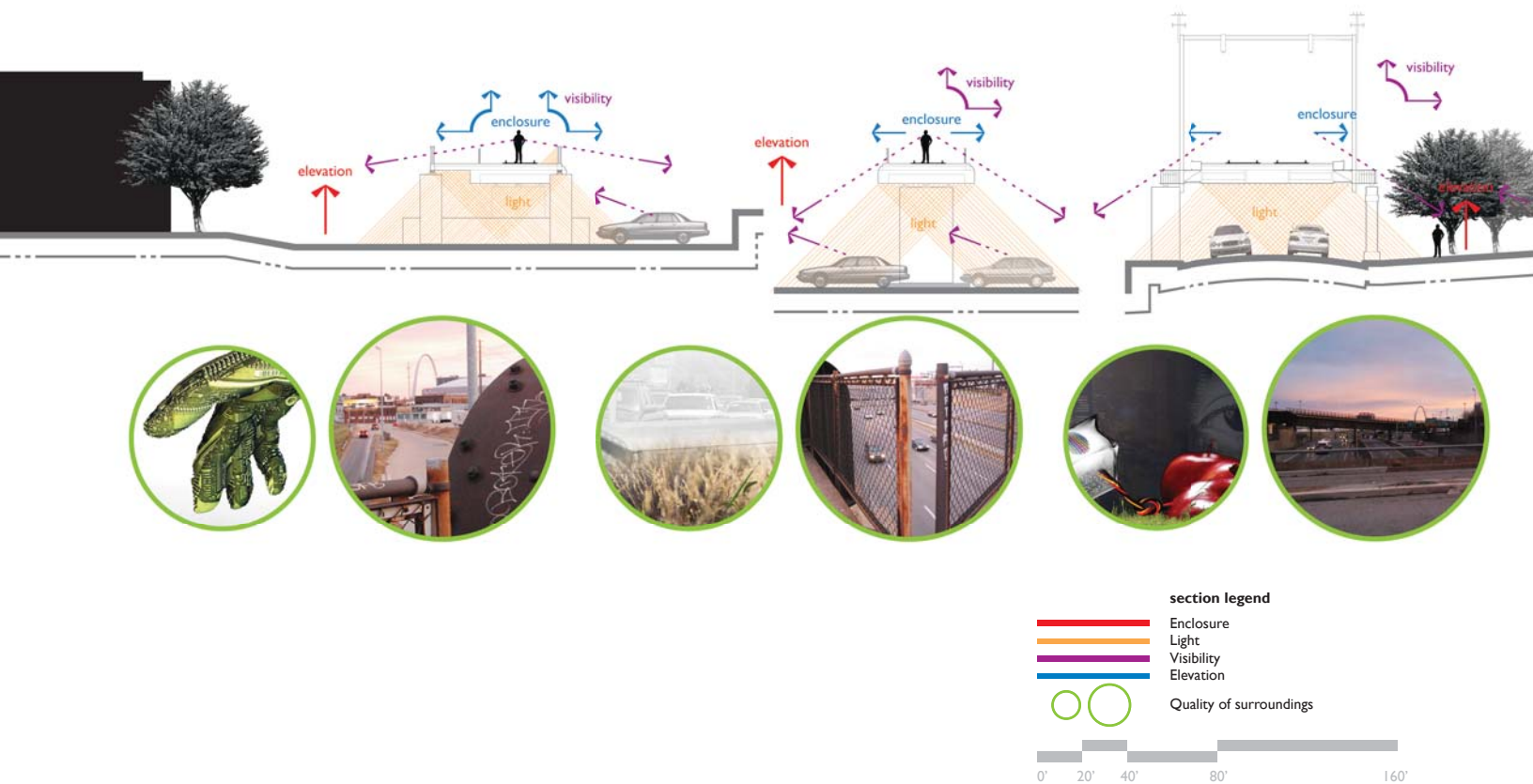
### quality of surroundings

Though bridge appears deteriorated and failing, site actually displays structural strength. Replacement could seem superficial. Site contains many views, vistas, and vantage points.

### capability in applying the s.r.am.e. strategy

In order to make functional, access points must be added that are visible and negotiable by multiple forms of transportation. In order to increase safety and security, light must be introduced to make visible and present to community, rails could be further reinforced. In order to make pleasurable, site must offer amenities and usable elements. View and lookouts to city, extensions into buildings or structures would be enjoyable. In order to visualize potential site design options, could use unused portions of Venice High Line, extend appendage to citizens, bring people up into space; bridge needs to have a reason as it is on a prominent lookout point. Capping the highway to create open space may be cost prohibitive but would enhance the open space amenities and overall linkage.





enclosure

light

visibility

elevation

quality

Safety enclosures with unconstricted viewsheds at a stable level suggests

**SAFE, FUNCTIONAL, VISUALLY AND PHYSICALLY PLEASURABLE ENVIRONMENT**

Light introduction and potential quality of surrounding maintenance could suggest

**POTENTIALLY ENHANCED ENVIRONMENT**

**color rating legend**

- High issues-constraints/low potential
- Medium-high issues-constraints/medium-high potential
- Medium issues-constraints/medium potential
- Medium-low issues-constraints/medium-low potential
- Low issues-constraints/high potential

## analysis [site 7: elevated to ground transition]

### enclosure

Highly enclosed within woody vegetation. Rail line runs through wooded area. Street level is enclosed by buildings with low exterior visibility.

### light

Perforated light visible through vegetation. Majority of site is encased in shadow with minimal artificial night lighting. Few residents seen through streets.

### visibility

Rail distance from street and ground level keeps visibility low. Difficult visual access into and out of site.

### elevation

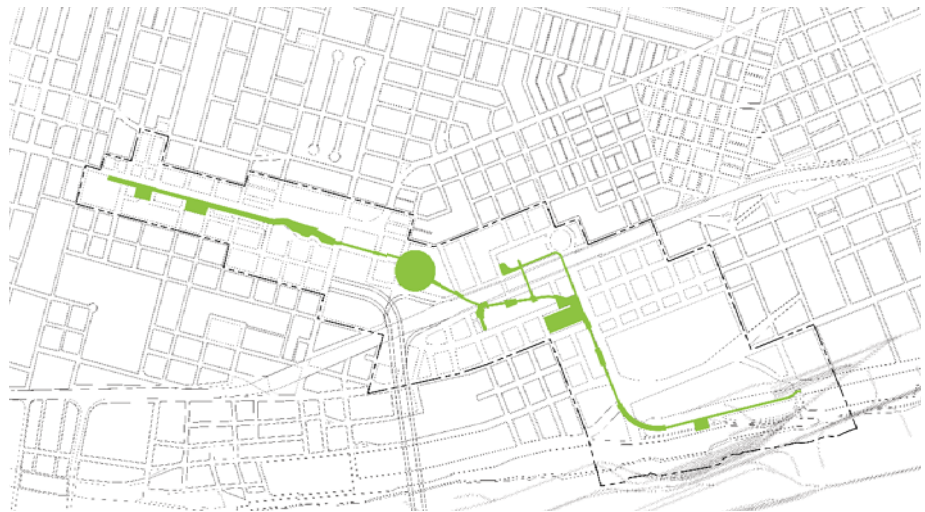
Rail transitions from ground level to elevated moving from 0' to 20'.

### quality of surroundings

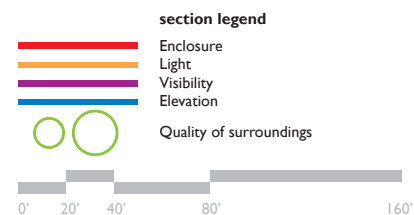
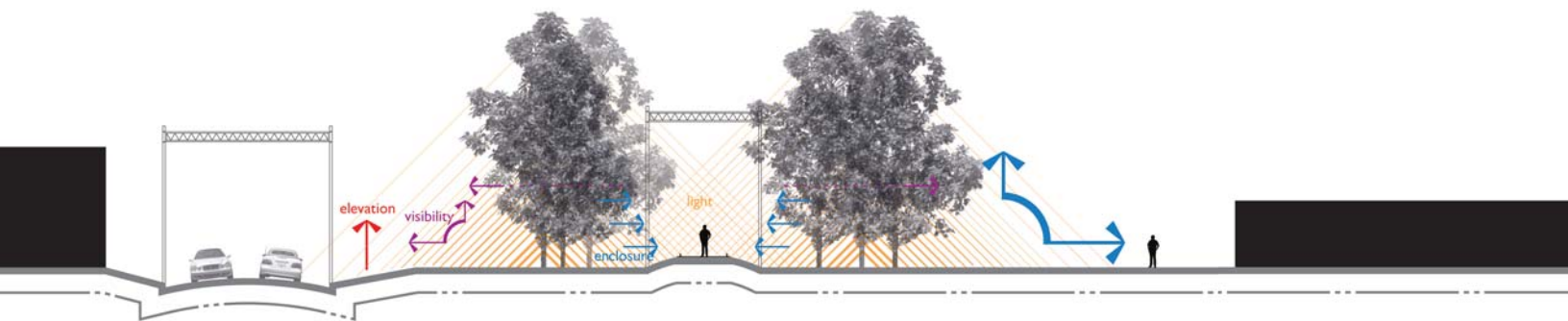
Rail needs to be replaced and maintained. Vegetation is a scrub, urban, and invasive variety. Neglected buildings could be revitalized.

### capability in applying the s.r.am.e. strategy

In order to make functional, rail must either be replaced and access must be returned to reach bridge level. In order to increase safety and security, light must be introduced to make visible and present to community. In order to make pleasurable, site must offer amenities and usable elements. In order to visualize potential site design options, vegetation needs to be freed up for space use, rail needs to be capitalized upon, commercial buildings can have adaptive reuse, residents need to be reintroduced into what was formerly a mixed-use and ethnicity residential working quarter.







enclosure

light

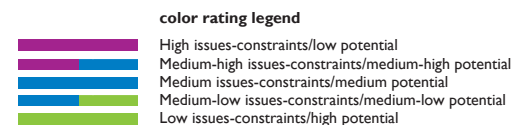
visibility

elevation

quality

Heavy enclosure combined with low lighting levels and visibility from street suggests  
**UNSAFE, VISUALLY UNPLEASANT ENVIRONMENT**

Hidden reuse potential within natural vegetation transition from ground to elevated suggests  
**POTENTIALLY SAFE, PLEASURABLE ENVIRONMENT**



## analysis [site 8: ground level trackage]

### enclosure

Visible to street level with open neglected space to the west and mixture of commercial and transportation structures to east.

### light

Open to natural light. The area is potentially unsafe due to lack of night lighting elements. There is limited shadow obstruction from buildings as the majority are medium elevation.

### visibility

The on-grade rail is visible to pedestrians and vehicles. Few residents are visible through the area as the majority of people are a transient population.

### elevation

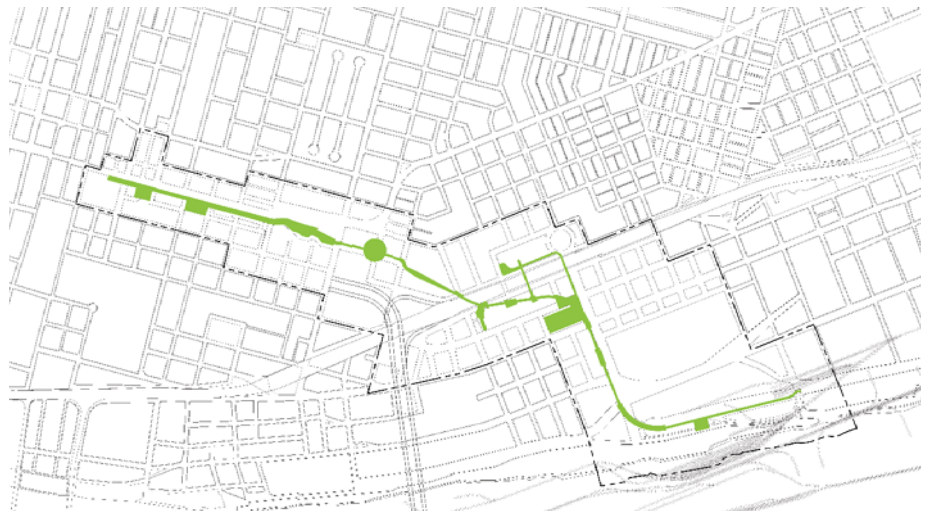
Negotiable terrain on grade but limited horizontal visibility due to commercial and light industrial structures.

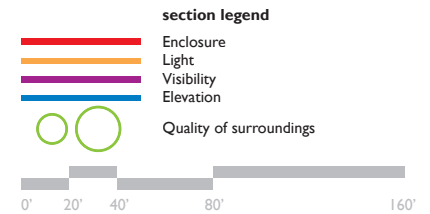
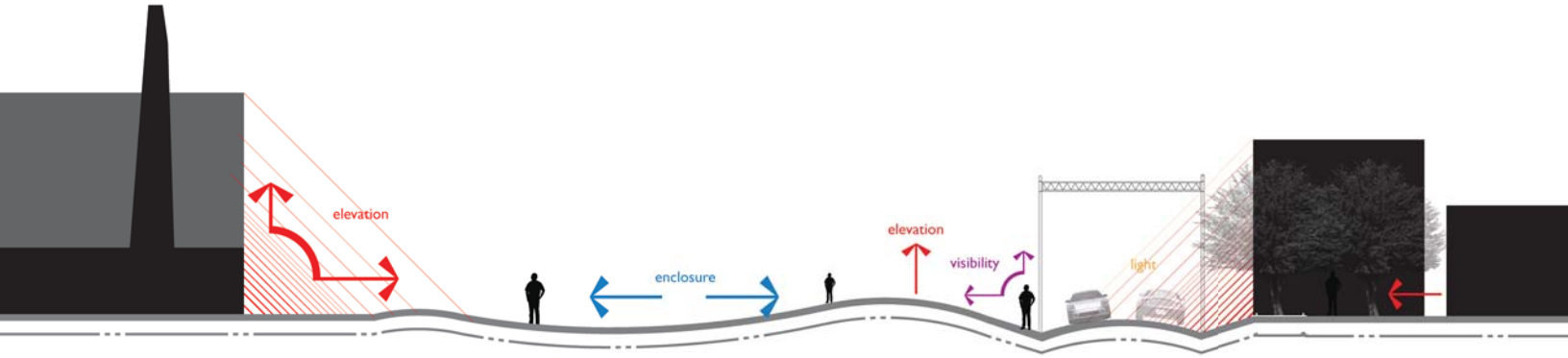
### quality of surroundings

Neglected sites and buildings dot the site. The planned highway infrastructure addition could potentially limit site development. There are several industrial remnants left on site that create an industrial, neglected, and unmaintained character.

### capability in applying the s.r.am.e. strategy

In order to make functional, tracks need to be repaired, streets and walks need maintenance, and vegetation needs to be cleared or maintained. In order to increase safety and security, more artificial night lighting must be introduced, infrastructure additions need to be considered. In order to make pleasurable, street level must include site amenities, potential recreation points, and destination points. In order to visualize potential site design options, site adjacencies and building vacancies must be capitalized upon, proximity to main streets must be taken advantage of and Cass Street and I-70 addition improvements need to be considered.





enclosure

light

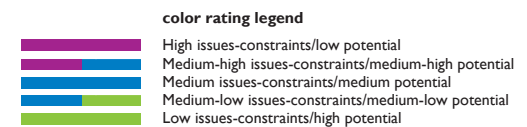
visibility

elevation

quality

Moderately safe secure site, open and highly visible at street level  
contributes to easy accessibility, suggests  
**POTENTIAL SAFE, PLEASURABLE ENVIRONMENT**

Limited street lighting, lack of building occupancy, and overall neglected  
appearance suggests lack of use and density suggests  
**POTENTIALLY UNSAFE, VISUALLY UNPLEASANT ENVIRONMENT**



## analysis [site 9: subway transition entrance]

### enclosure

Enclosed by concrete walls on two sides with narrow gravel pathway, open to air and sun but constricted between trees, prevents street level visibility.

### light

Potential natural light obstructed by height of vegetation, constricting presence of walls, lack of night security lighting.

### visibility

Below grade subway needs exposure to street, lack of access points into site with current one-way access, no view of city or exterior.

### elevation

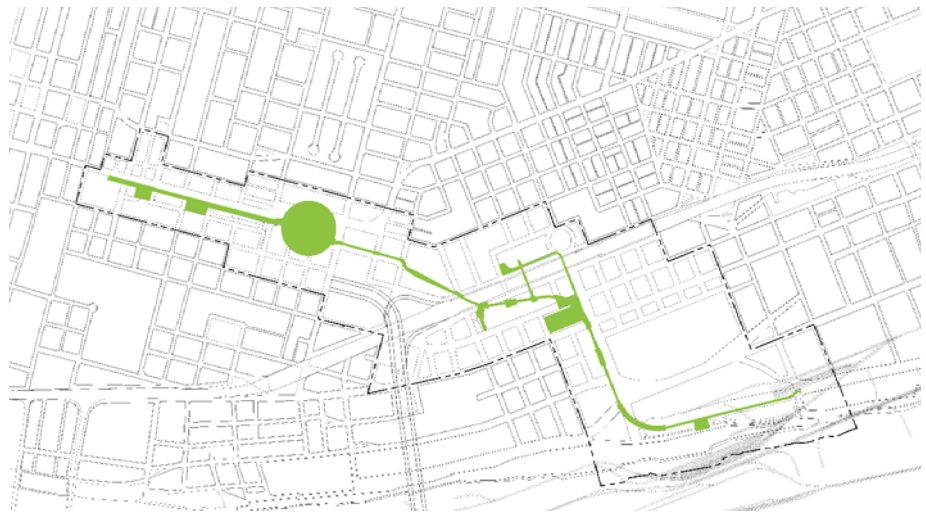
Path is all below grade (approx. 20'), hidden from street presence and visibility.

### quality of surroundings

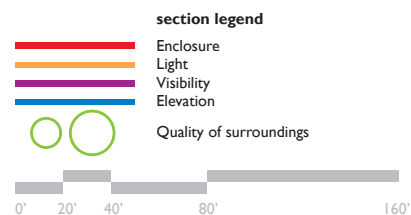
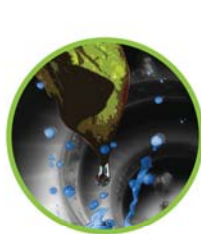
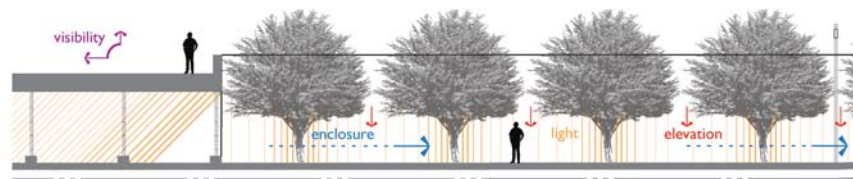
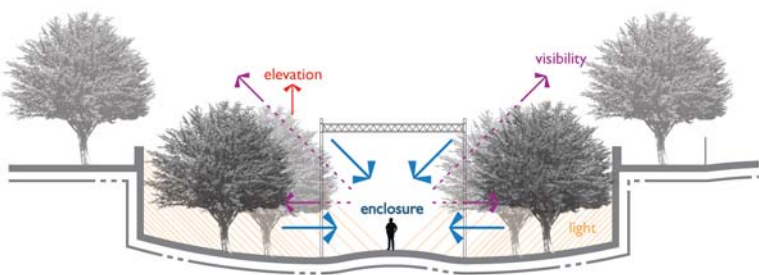
Deteriorating materials, poor maintenance on existing materials, debris and Trestle remnants remain, 'homeless shelter.'

### capability in applying the s.r.am.e. strategy

In order to make functional, maintenance must be performed on site elements to bring up to code, one-way access must turn to two-way, and basic amenities and utilities must be introduced. In order to increase safety and security, debris must be cleared, dark enclosed spaces must be opened and lit, and place must increase street level presence. In order to make pleasurable, subway must feel safe and welcoming with light introduction, pathway needs visible presence, and site elements for rest and recreation must occur. In order to visualize potentials, under-utilized site adjacencies must be capitalized upon, people must have a destination point, less constricting presence, vegetation must be mediated, and safety needs to increase within what is currently used by as a homeless transient center.







enclosure

light

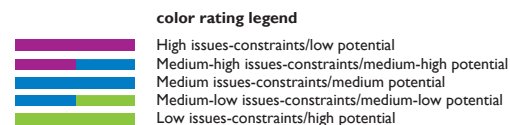
visibility

elevation

quality

Heavy enclosure - low light levels - low street visibility - below grade elevation - poor quality of surrounding suggests

**POTENTIALLY UNSAFE, VISUALLY UNPLEASANT ENVIRONMENT**



## analysis [site 10: underground subway-street extension]

### enclosure

Site is open to views at street level and closed when within subway. The encased portion runs underneath primary vehicular circulation routes into downtown and are inaccessible.

### light

Low light level within subway and high level of sunlight at street level. Night lighting is present.

### visibility

Physical and visual accessibility into site is limited due to enclosed subway portion.

### elevation

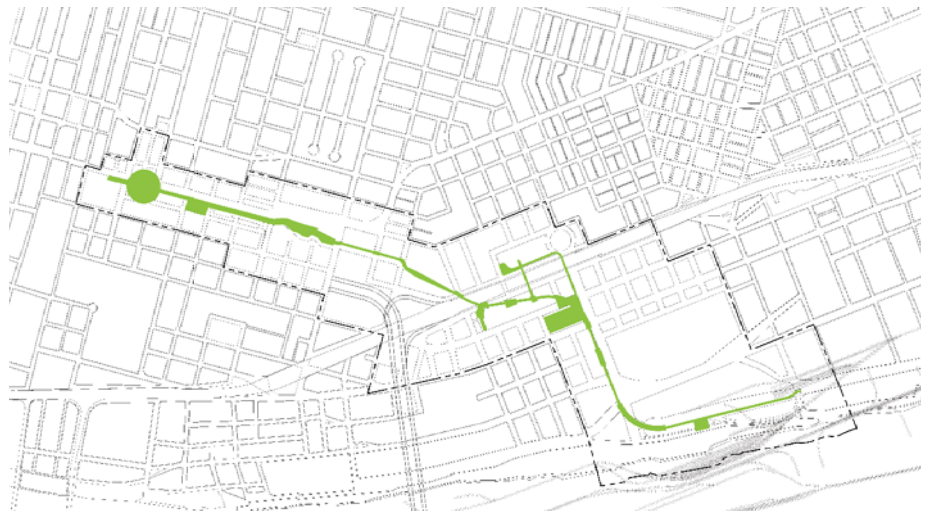
Approximately 17-20' below grade in subway with access points leading to current transient population camp at subway entrance.

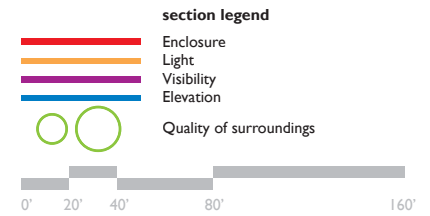
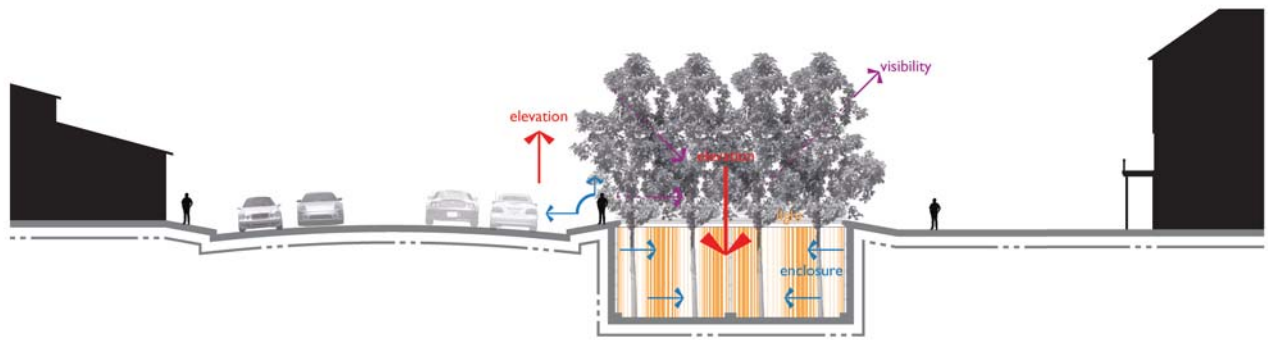
### quality of surroundings

Near new development and existing parcels. Rail line is walled and closed requiring maintenance or street may collapse due to structural failure.

### capability in applying the s.r.am.e. strategy

In order to make functional, maintenance must be performed on site elements to bring up to code, subway must be fixed to stabilize street, sidewalks must be repaired, and empty lots need to be utilized. In order to increase safety and security, debris must be cleared, dark enclosed spaces must be opened and lit, grade separation must be mediated, and place must be visibly present and accessible. In order to make pleasurable, subway must feel safe and welcoming, light needs to be introduced, and people must feel secure in surroundings. In order to visualize potentials, site must be made accessible both below and on grade, under-utilized site adjacencies must be capitalized upon, subway must be freed up and opened, and people must have a destination point within site.





enclosure

light

visibility

elevation

quality

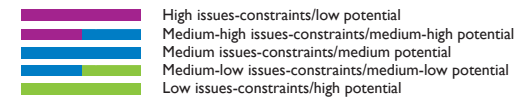
Heavy light level, on-grade elevation, and moderate quality of surroundings leads to potential

**SAFE, PLEASURABLE ENVIRONMENT**

Semi-enclosed and moderate visibility from below-grade subway suggests

**POTENTIALLY UNSAFE, VISUALLY UNPLEASANT ENVIRONMENT**

**color rating legend**



Sites one, six, and eight (*gateway, the bridge, ground level trackage*) retain the highest potential for improvement and lowest quantity of issues-constraints. The sites are characterized by lower rates of enclosure; higher amounts of safety-security lighting; accessible views from points both on and towards the structure; are at a navigable pedestrian level enabling safety-security of the user; and, offer a quality of surroundings that have potential to either be improved or are in position to be enhanced.

Establishing the Trestle's identity is the first priority for redevelopment and is the basis for the selection of three sites (one from each of the three noted structural types of elevated, ground-level transition, and subway) spaced at various intervals along the Trestle line.

Sites four and ten (*elevated commercial district, underground subway-street extension*) are noted as medium level of issues-constraints and medium potential for improvement. In order to initiate connection along the track, sites four and ten offer links to downtown and through the industrial quarter. Establishing a financial base and incorporating existing fabric (social, economical, and ecological sources) is important for phase two.

Sites two, three, five, seven, and nine (*elevated working riverfront, elevated industrial quarter, open space below elevated, elevated to ground transition, subway transition entrance*) offer the most significant levels of issues-constraints and lowest initial potential for improvement. Common physical traits do not necessarily characterize sites two, three, five, seven, and nine as much as the limitations for design. The sites create a sense of insecurity and lack functional infrastructure. The structures are either hidden, inaccessible physically and visually, and need significant safety improvements in order to revitalize for use.

The qualitative assignment of ratings for issues-constraints and potential for improvement are not indicative of successful sites to be further developed and designed. The ratings provide a framework for assigning *phasing levels of importance* for each site. By initially focusing on developing one site from each of the three character types and then rehabilitating sites in order of difficulty to create, the successful implementation of the S.R.A.M.E. Strategy can be achieved through an interconnected, looped, and holistic network.







I D E A - T A G E

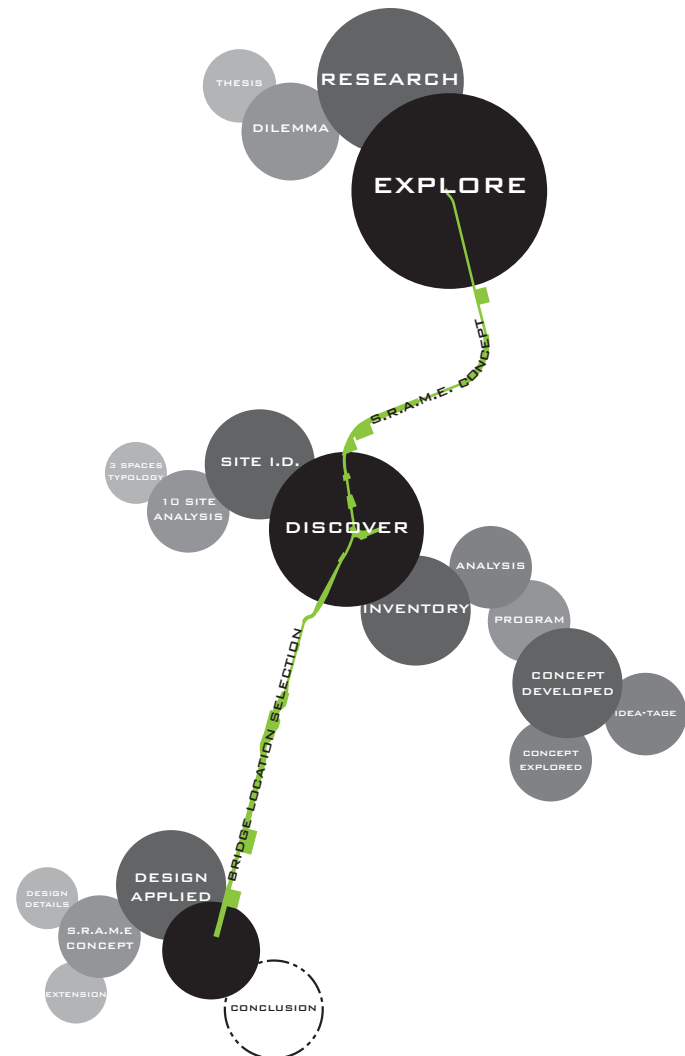


## idea-tage [methodology]

Site inventory and analysis information is synthesized to graphically represent abstract ideas for design. The idea-tage phase of the *discover* process characterizes each of the ten individual site's potential based on keyword association. When possible, the S.R.A.M.E. Strategy is applied for generating conceptual design elements.

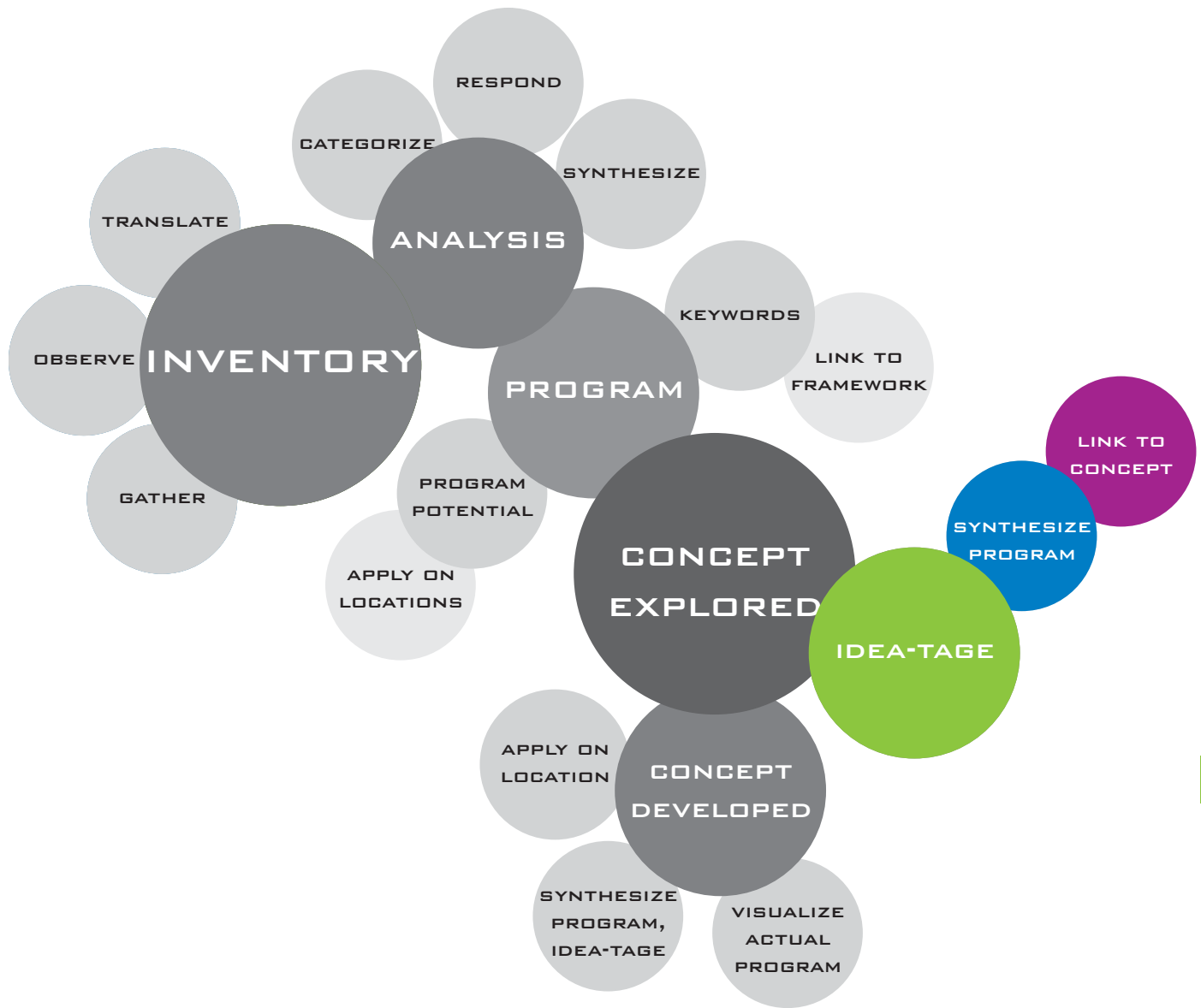
### process philosophy

Although not intended to directly translate into design solutions, the abstract ideas serve as foundation for conceptual design application of programmatic elements. The ideas generated through idea-tage connects unique site information with design decisions.



f 3.23a design process: a methodology applied. illustration created by designer 2009



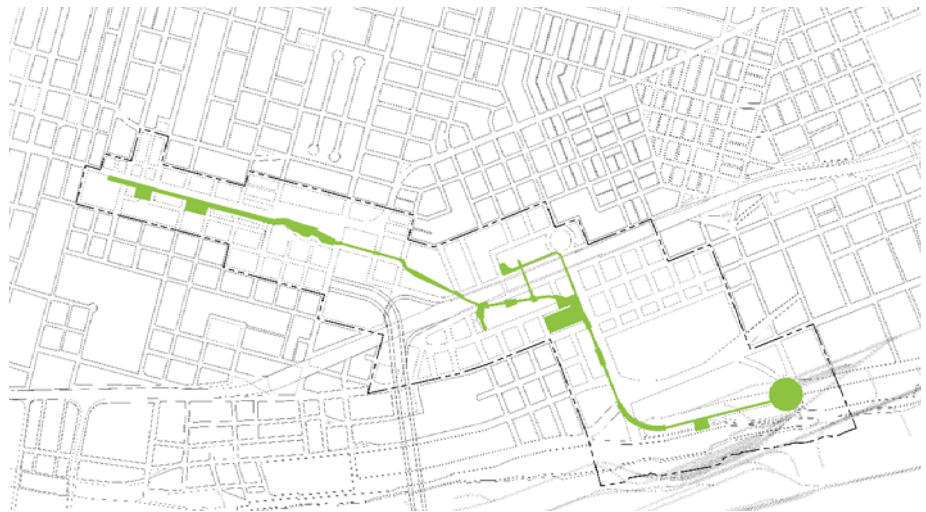


## idea-tage [site 1: gateway]

Can a connective link be established to *initiate* and identify the Trestle as an emergent open space system?

Can a system *transcend* the normative bounds of traditional design? From single-celled amoeba into a complex organism, will the Trestle *evolve* into a interwoven linked open space?

What are the implications of increased security? Will it be Orwell's *1984* in 2009?



f 3.24a location plan: idea-tage of site one. illustration created by designer 2008





initiate  
transcend  
evolve

gateway

inform

begin

mark

access

## idea-tage [site 2: elevated working riverfront]

How can the Mississippi River *connect* with the Trestle?

Will it be possible to extend, move out, and reach so as to *stimulate* interaction?

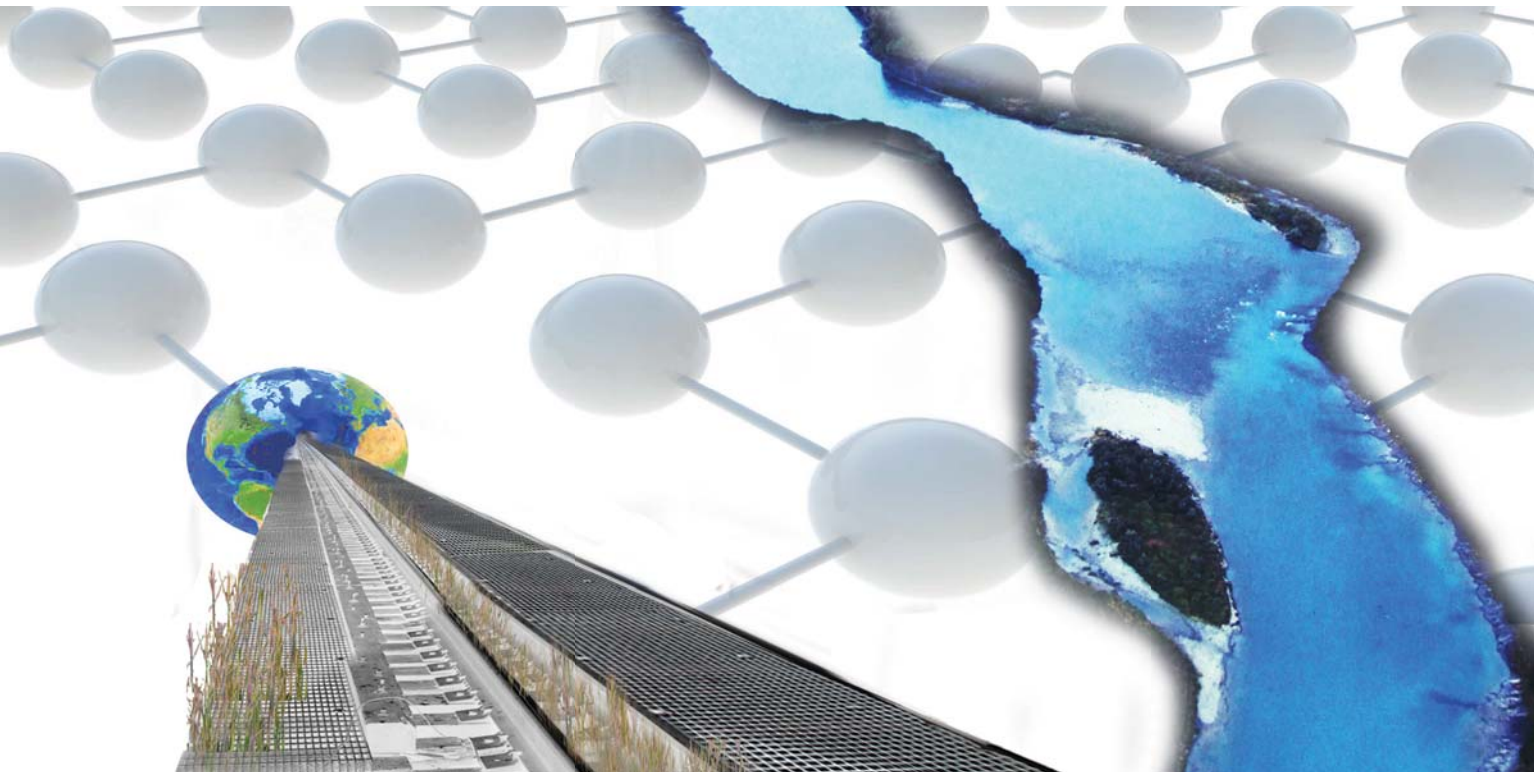
What bounds must be crossed to *bridge* the gap separating the user from the working river?



f 3.25a location plan: idea-tage of site two. illustration created by designer 2008







connect  
stimulate  
bridge

extend

grasp

append

transform

## idea-tage [site 3: elevated industrial quarter]

Can we plug-in, recharge, *activate* the industrial quarter of the Trestle?

How can the workers, users, visitors, truck-drivers, mechanics, factories, commercial businesses *integrate* their lives into the workings of the extending Trestle?

Can work become play, recreation a profit, economics a past-time?



f 3.26a location plan: idea-tage of site three. illustration created by designer 2008





# activate integrate work

connect

access

views

impact

link

## idea-tage [site 4: elevated commercial district]

Can we reach out to our businesses, bridge the cultural and social divide, literally extend our hands to integrate the existing fabric into the Trestle's system?

Is city nature and nature city in a fully *integrated* method?

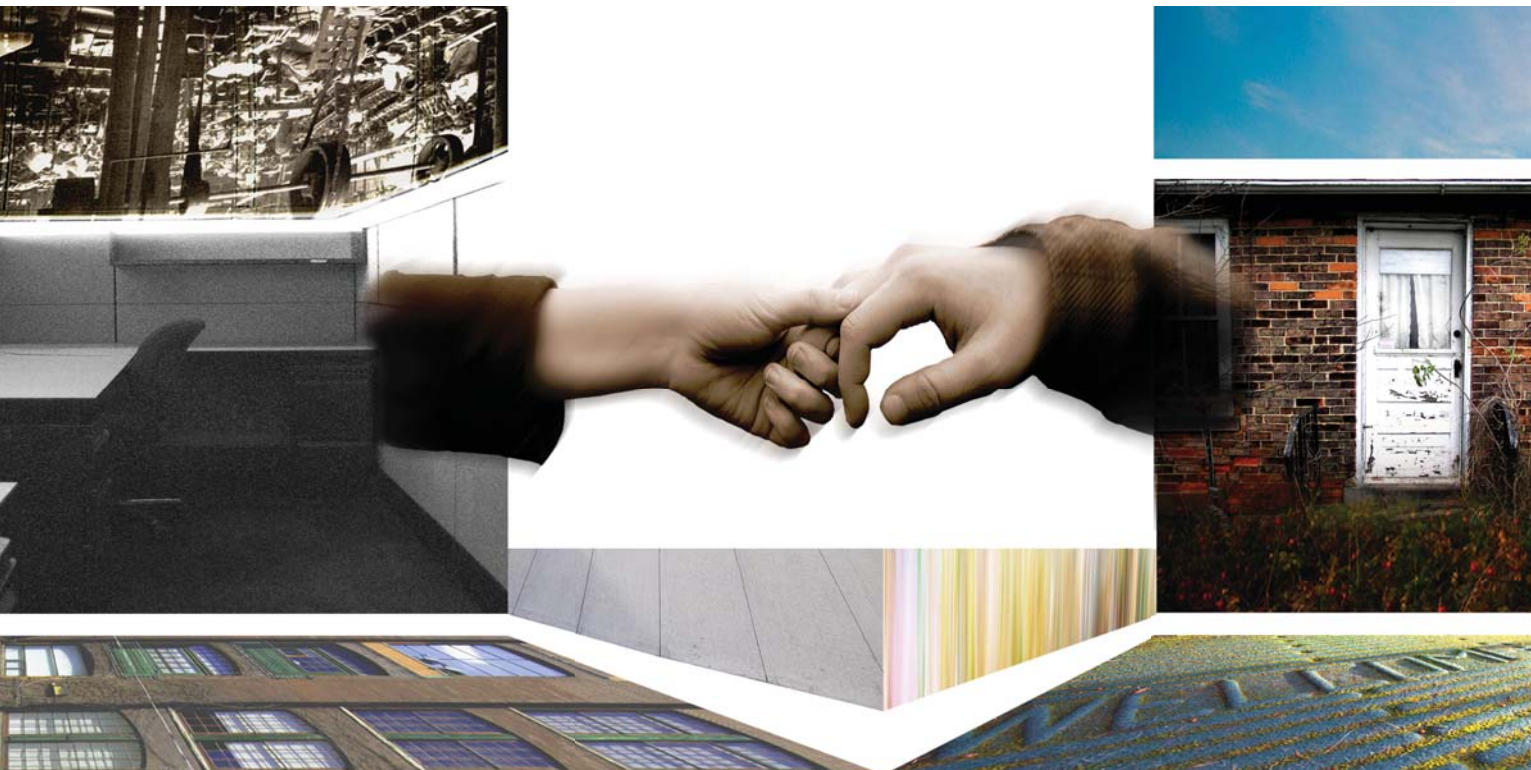
Can our homes be where we work, and our work be a natural *emergent* extension of our daily lives?



f 3.27a location plan: idea-tage of site four. illustration created by designer 2008







extend  
integrate  
emerge

capitalize

educate

involve

access

## idea-tage [site 5: open space below elevated]

As the largest contiguous tract of unused open space can the existing landscape *provide* a temporary and permanent public space extension?

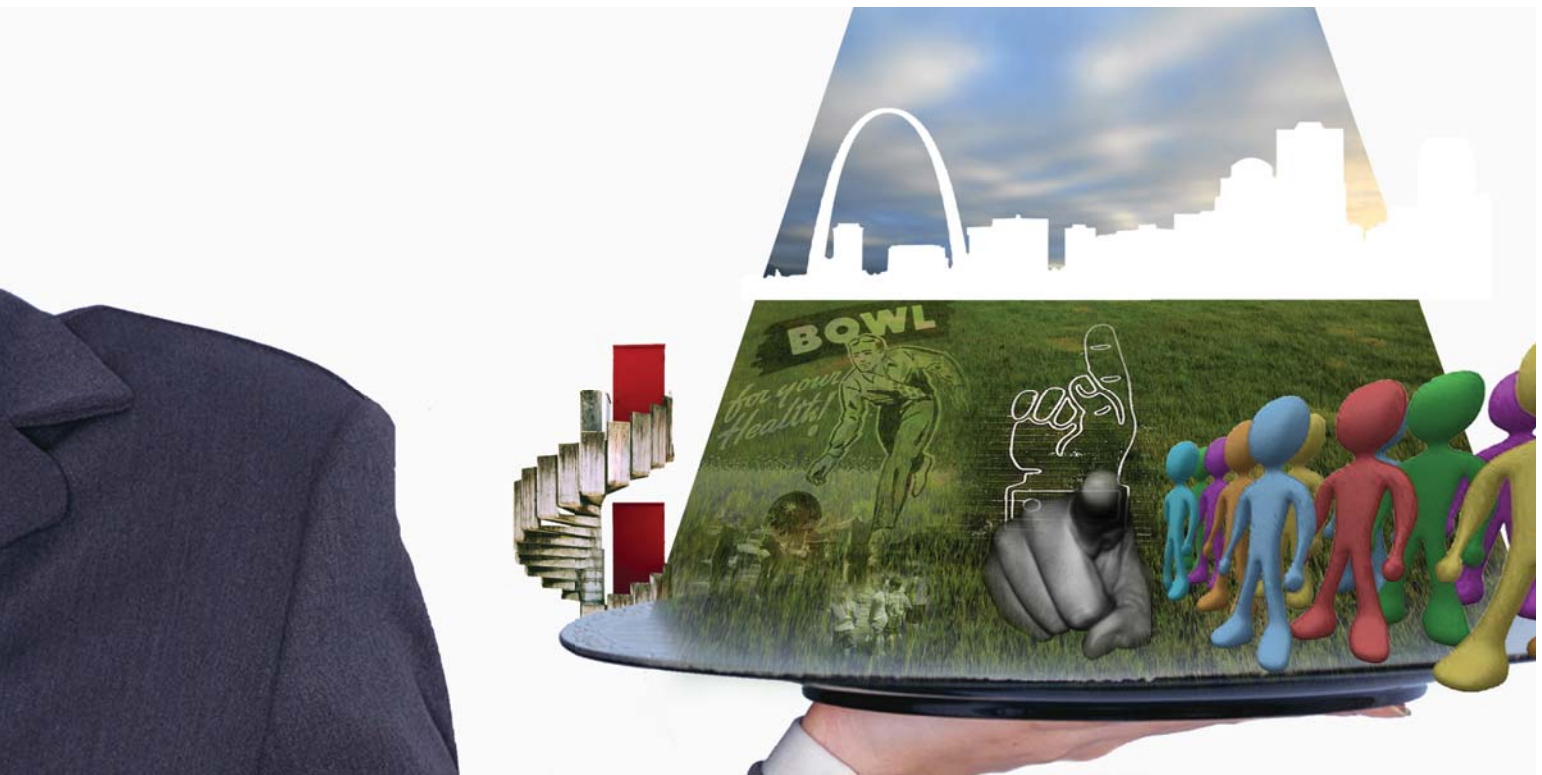
Will the options for recreation, enjoyment, economics, shelter, initiating point be able to respond and *react* to evolving changes?

Can the definition of a traditional 'park' be reestablished with the emergent system's *extension* from simple green, open space into city beautifier, social enabler, involved ecosystem?



f 3.28a location plan: idea-tage of site five. illustration created by designer 2008





# provide

react

extend

grow

access

visualize

attract

multi-use

## idea-tage [site 6: the bridge]

With prominent views and vistas, existing ease of accessibility, and visual prominence for multiple potential users, how can the Trestle *visualize* its impact?

What device will fully *expose* the Trestle's latent potential as a redefining open space system?

Can a sensing, responding, adapting, mutating, and emerging system *react* to the evolution of the Trestle from simple path into long-term connective open space system? Did city come from nature or nature from city - or is there even validity in the assumption that one derives the other? Would it not be more beneficial to assume the two coexist and fuel the other's development?

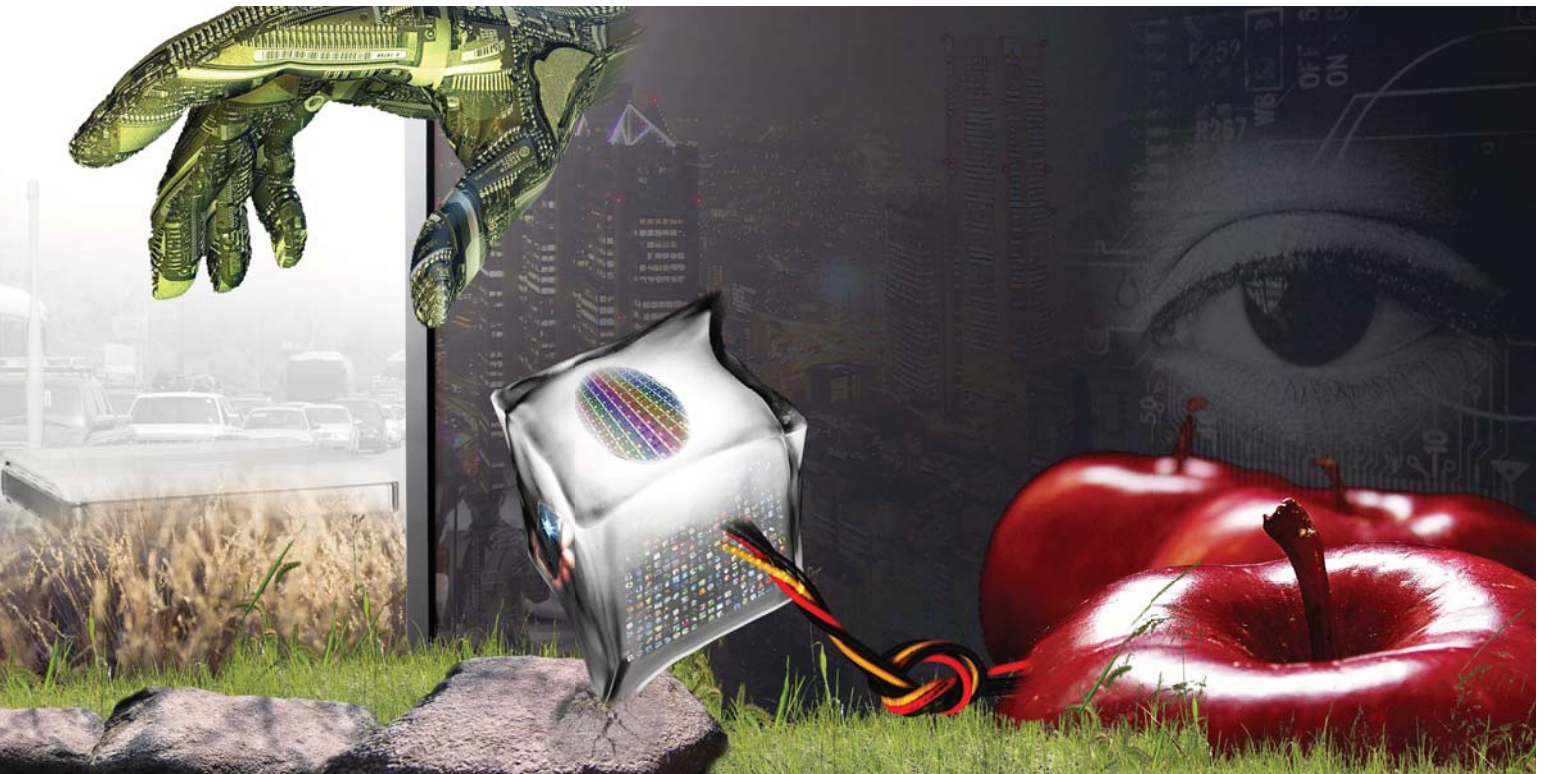
What are the implications of increasing surveillance? Will the city benefit - or be subject to the electronic media explosion?



f 3.29a location plan: idea-tage of site six. illustration created by designer 2008







# visualize

expose

react

rhizome

identify

inform

connect

educate

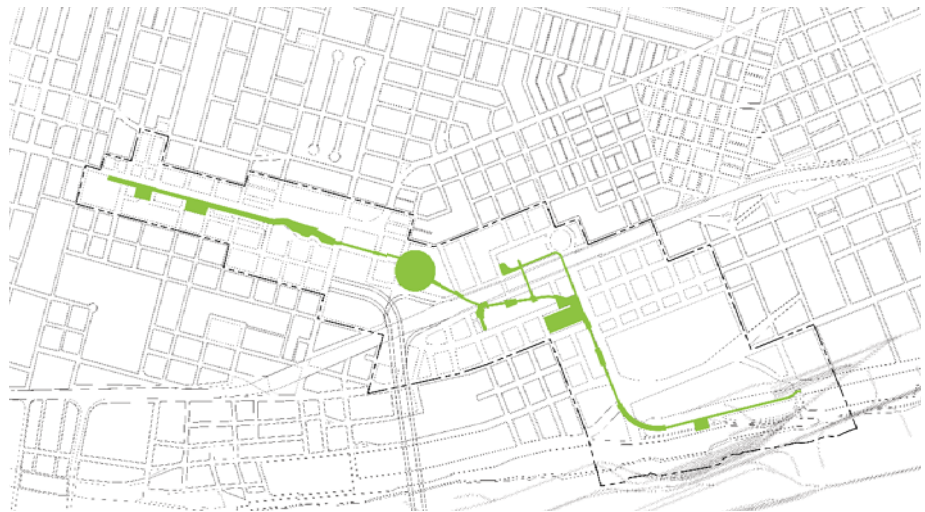
sense

## idea-tage [site 7: elevated to ground transition]

How can an existing scrub vegetation system transform what was once a residential quarter into a revived, alive, *invigorated* district?

Can the *enclosed* be opened, freed, extended to enjoy the catalytic effects of the Trestle?

Is there a method of applying an interconnected, reactive, and responsive *system* to stimulate use as a destination point, residential center, or multi-mixed use functional area?



f 3.30a location plan: idea-tage of site seven. illustration created by designer 2008





# invigorate

## enclosed systems

hidden

revealing

sensory

disturbed

tranquil

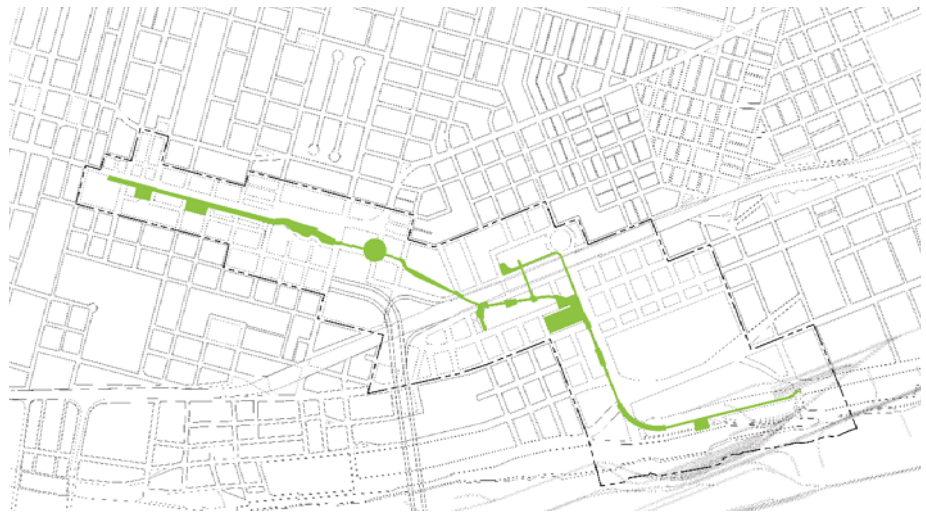


## idea-tage [site 8: ground level trackage]

Let us reach out, extend our hands, *embrace* what has been provided - an open, brown, wasted site complete with abandoned industrial remnants parallel to functional businesses.

Can an economic stimulus invigorate the *neglected* and provide financial backing for the future?

Will the transformations lead to the creation of a *gateway* capable of educating, enjoying, stimulating, creating, revitalizing?



f 3.31a location plan: idea-tage of site eight. illustration created by designer 2008







# embrace

## neglected gateway

educate

linear

stimulate

landmark

revitalize

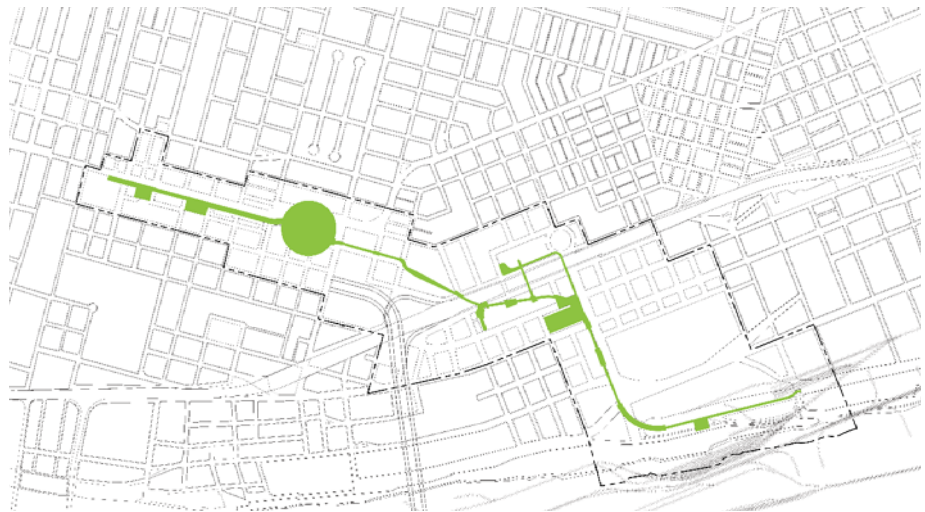
## idea-tage [site 9: subway transition entrance]

Like the rhizomatic extension of DNA strands, the double helix - never meeting, always seeing, constant moving - suggests the capability to *enliven* the neglected, wasted, overgrown subway system. What can be done to enable its population - transients - to be integrated within future development?

Can the subway be a *catalyst* for development - both now and in the future?

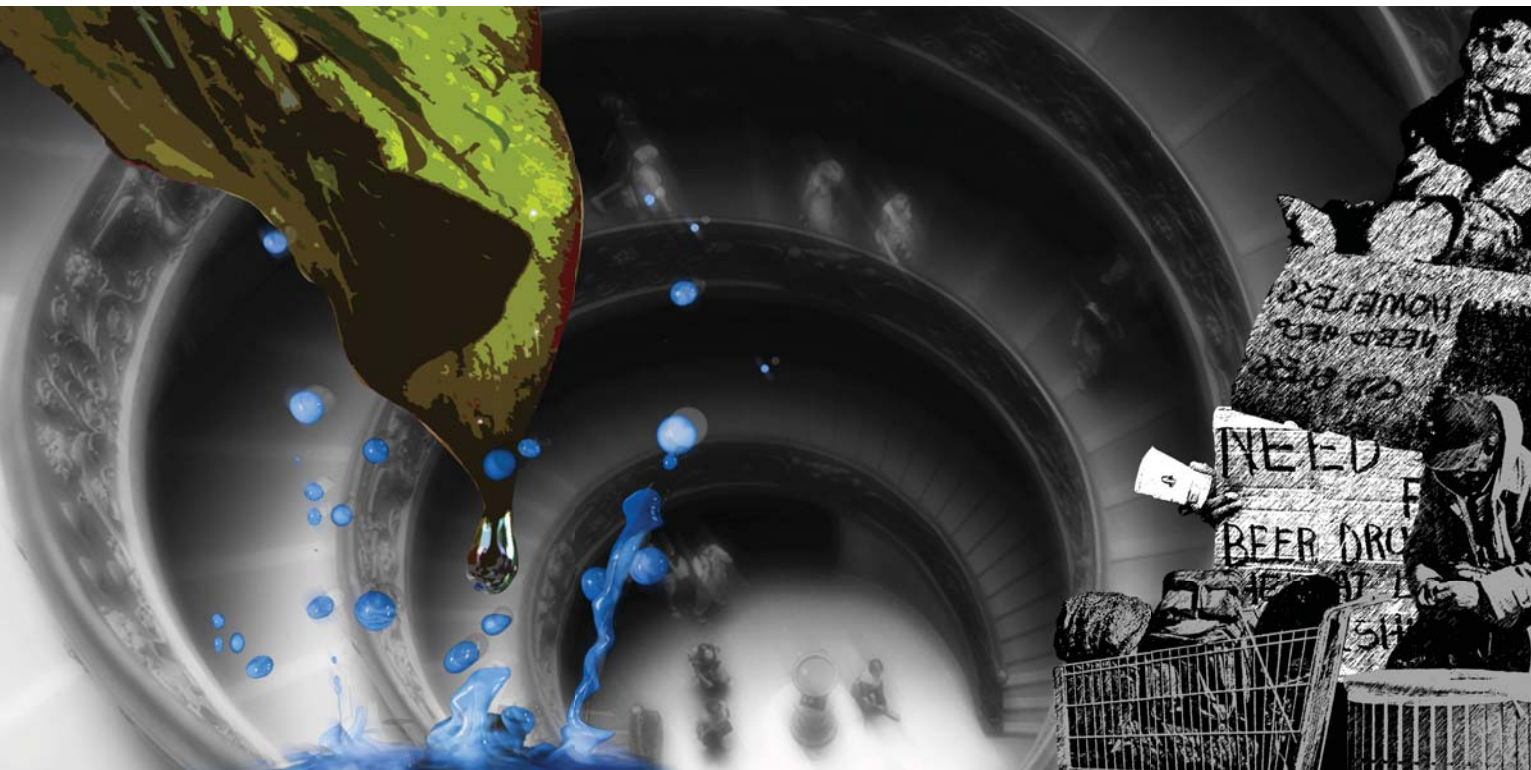
What measures must be taken to *involve* existing users, potential residents, and future guests?

Can preventive measures gentrify but not drive out, enable rather than push away, avoid social displacement while maintaining viability?



f 3.32a location plan: idea-tage of site nine. illustration created by designer 2008





enliven  
catalyze  
involve

253

expose

enable

rhizome

dynamic

visualize

restore

## idea-tage [site 10: underground subway-street extension]

Is it possible to *access* the hidden underground subway extension? Can an underground oasis be invigorated, created, enjoyed?

Can the *latent potential* of the subway emerge as a beneficial factor?

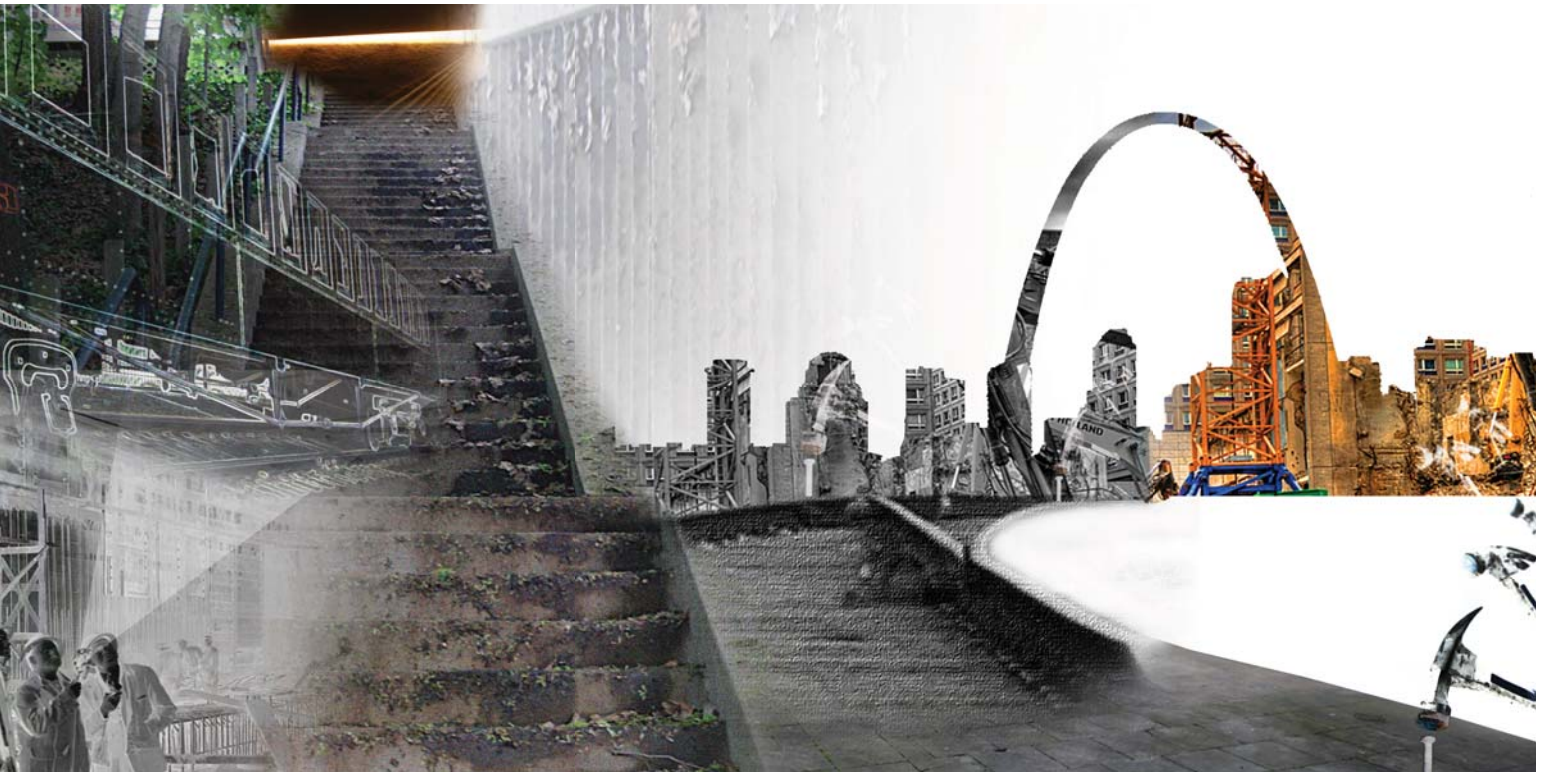
Will excavating, bridging, *submerging* into the bedrock create a unique experience capable of invigorating, stimulating, reacting to changes for the success of the Trestle and the connection to downtown?



f 3.33a location plan: idea-tage of site ten. illustration created by designer 2008







access  
latent potential  
submerge

retain

bridge

excavate

excavate

link

## idea-tage [conclusions]

There is potential in invigorating the Trestle, initiating movement into and through, exposing its structural and functional capabilities, and enabling catalytic growth - but the Trestle must be examined as an integrated whole. One part missing could prevent success - too many, and it may fail as well.

The ten sites indicate that the most pressing need is access. How will the paths enable movement if they currently are hidden, pushed aside, or unable to be traversed? Each site retains a unique characteristic - indicated in keyword generation - that can be exploited to create a distinct identity. Connecting the ten into one will be necessary. Generating actual elements to be implemented and phased over time will be crucial.

The idea-tages serve as foundation for conceptual development connection to programmatic elements.







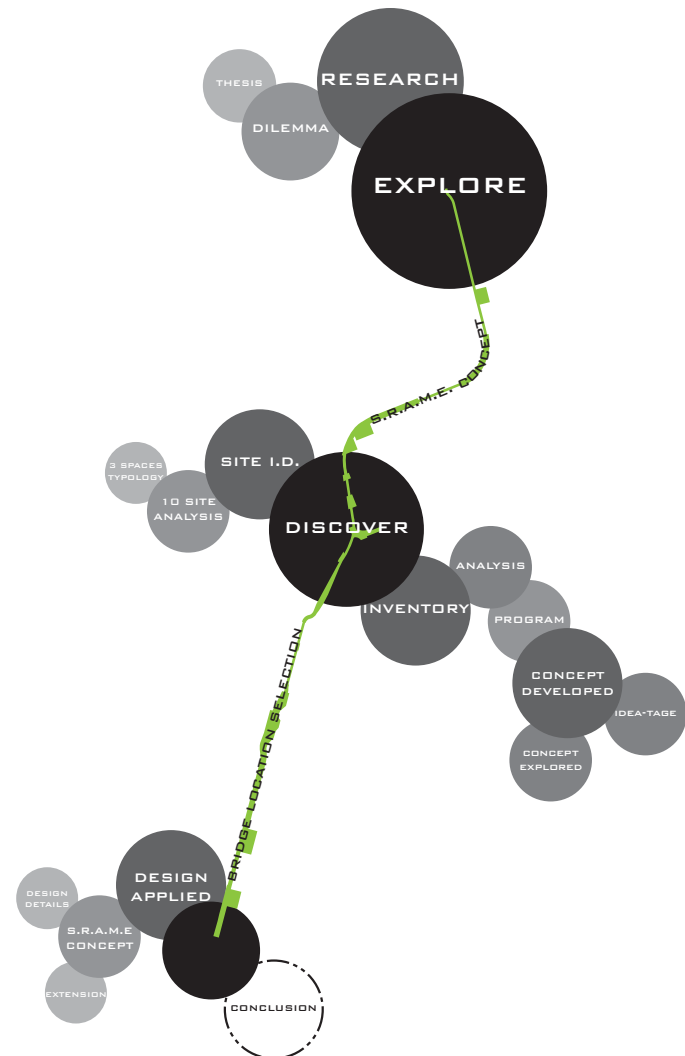
# P R O G R A M



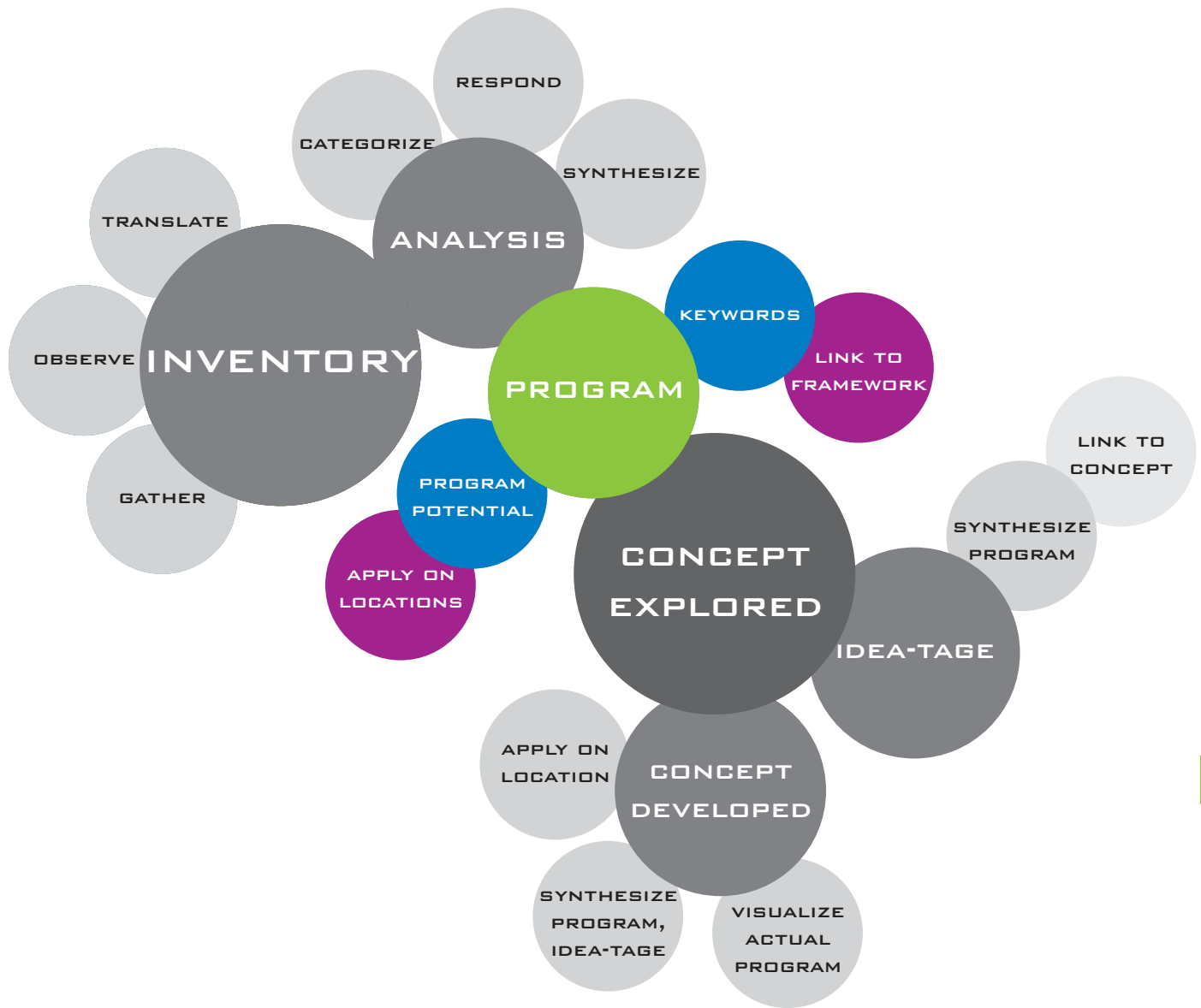
Programmatic keywords assigned during inventory-analysis-idea generation are matched to potential program to create relational chains. The program can then be compared to programmatic precedent relation to display how an intelligent environment would react with the implemented program. The suggestive program is then tested along sites to provide potential location of elements while not necessarily demanding exact placement.

### process philosophy

The program phase of the *discover* process works in tandem with inventory-analysis-idea generation to determine appropriate application of the S.R.A.M.E. Strategy. Synthesized results form the future design basis for location, elements, organization, and conceptual development. Abstract ideas are realized as functional elements. Suggestive objects or strategies then have the capability to be implemented or developed over time as technology becomes available.



f 3.34a design process: a methodology applied. illustration created by designer 2009



## program [site 1: gateway]

### sense

Sensory elements could include embedded sensors within the rail, bike trail, or river wall to inform decisions.

### respond

Responsive elements could include rail that moved with increased or decreased usage, accomodating changes in climate.

### adapt

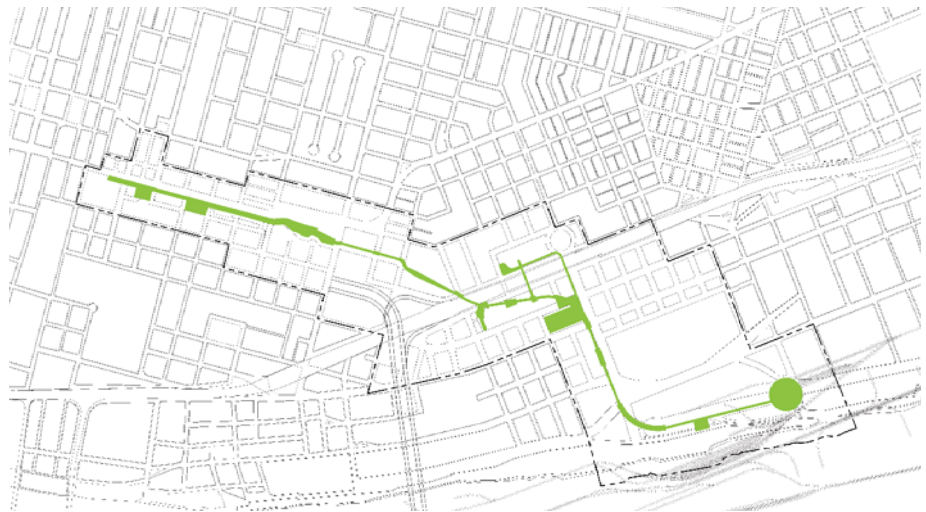
Adaptive elements could include trails or walls that could connect to Trestle to bring visitors to edge, describe working quarter of city, provide shelter or shade for trail users.

### mutate

Mutative elements could include connective appendages extending out to river or from river to trail.

### emerge

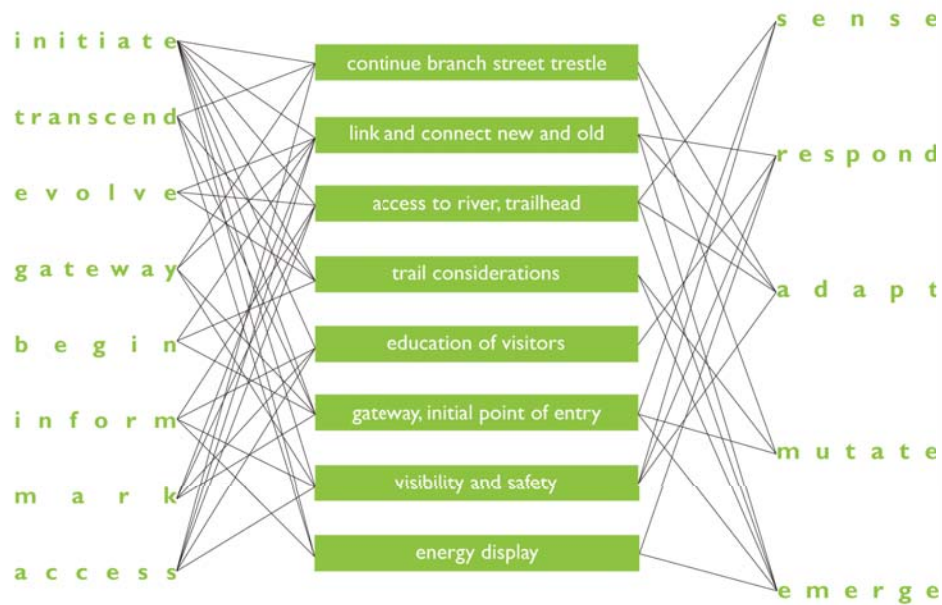
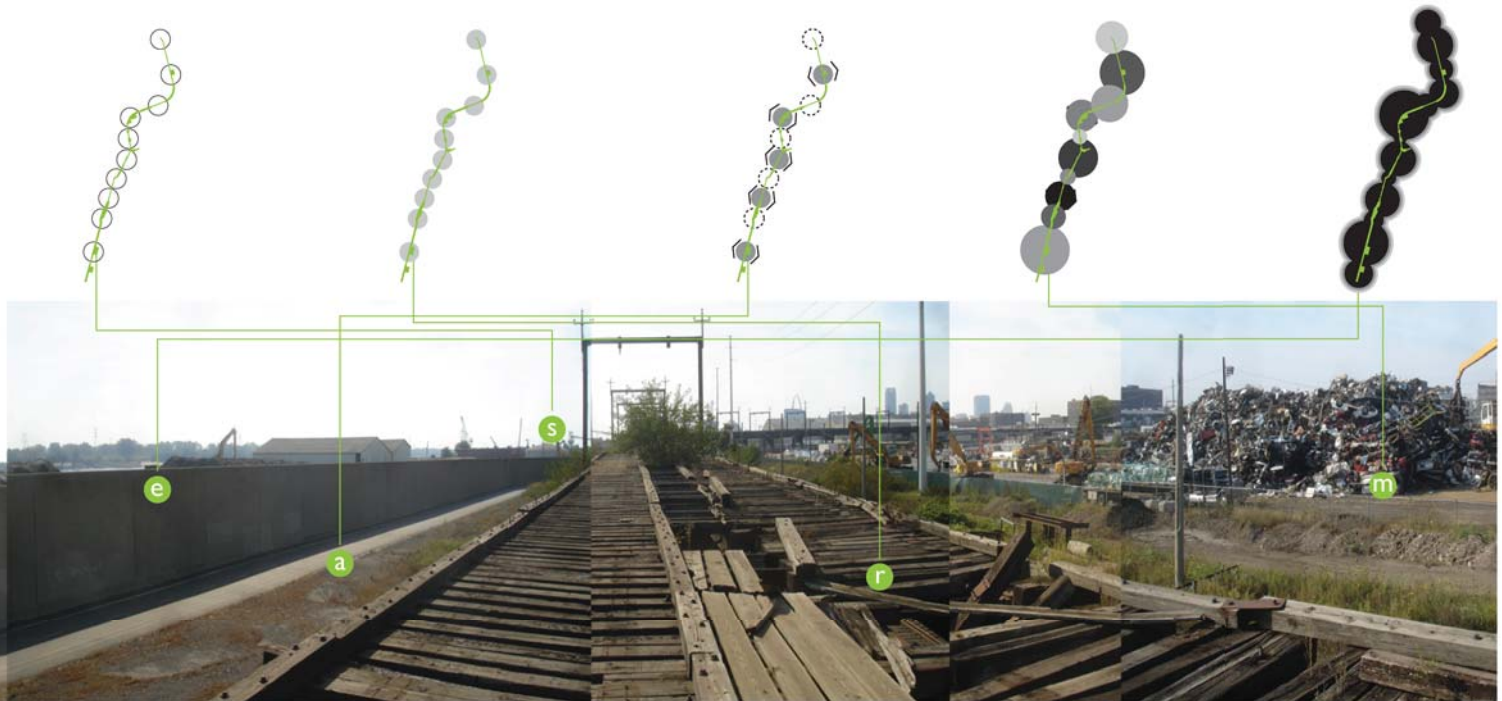
Emergent elements could include infrastructure that changes use over time, rail lines converted to new use, moving elements, recycling facilities changing use, industry converting to different need.



f 3.35a location plan: program of site one. illustration created by designer 2008







color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 2: elevated working riverfront]

### sense

Sensory elements could include embedded sensors within the vegetation and rail as well as exposing elements such as visual media.

### respond

Responsive elements could include sensors within revamped line that indicate usage patterns and then transform for amenity use.

### adapt

Adaptive elements could include site amenities and rail structures that would translate into functional elements such as shade, seating.

### mutate

Mutative elements could include rail structures that accomodated increased use, changed into shelter or seating, or vegetation that could change with need.

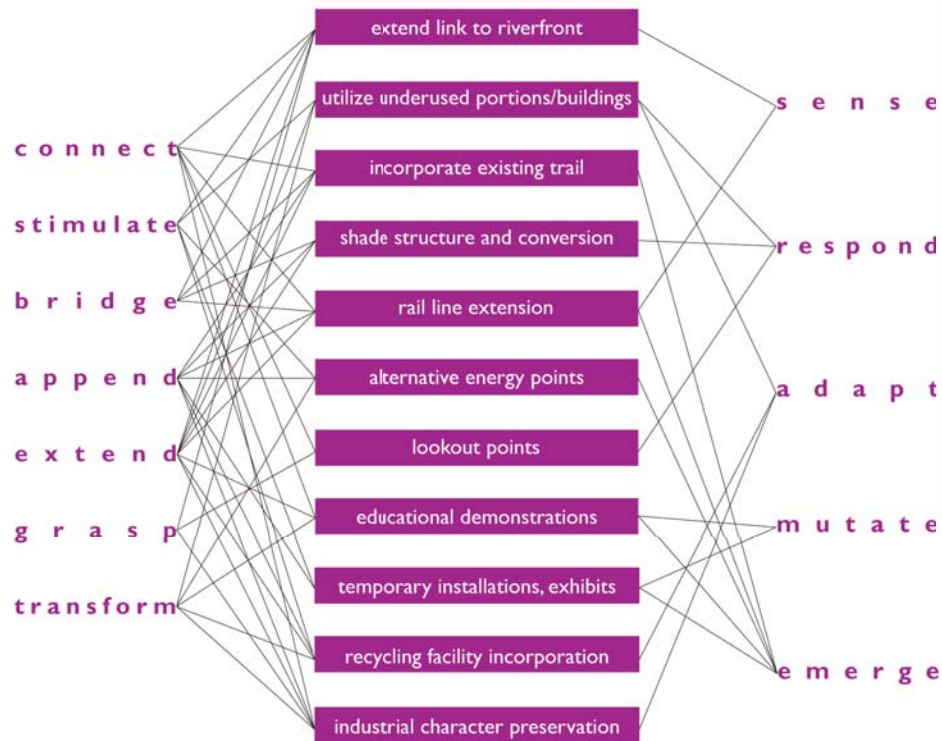
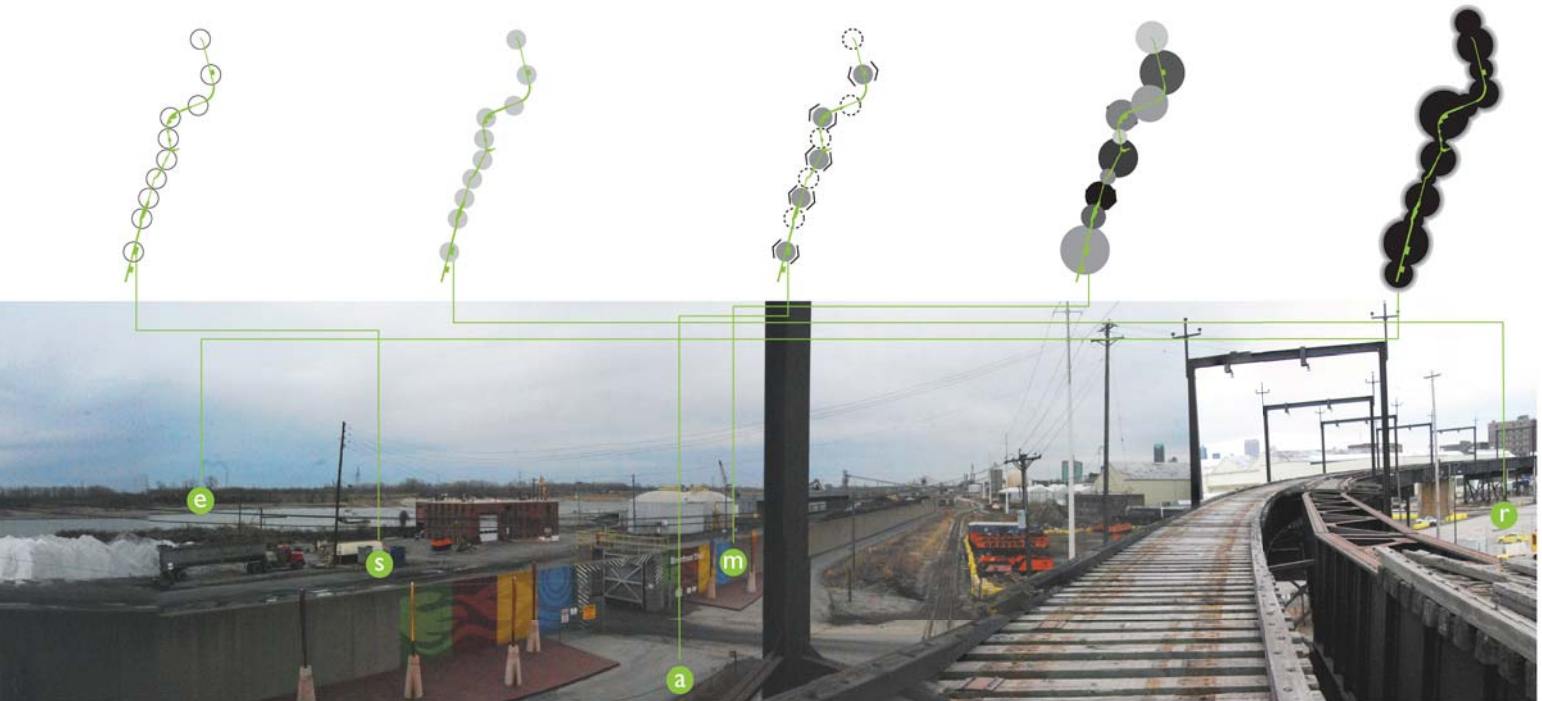
### emerge

Emergent elements could include vegetation that could become living walls, rails with mutating elements that could leave or grow depedent on use, or rail lines extending towards riverfront to incorporate working character into public space.



f 3.36a location plan: program of site two. illustration created by designer 2008





#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 3: elevated industrial quarter]

### sense

Sensory elements could include embedded sensors within the track line, at or near the site to monitor change, frequency, rates of usage to determine needs at Trestle level.

### respond

Responsive elements could include implemented or placed sensing devices that allow users to modify patterns, amenities, elements.

### adapt

Adaptive elements could include site features that change with increased or decreased usage.

### mutate

Mutative elements could include site elements changing due to necessity or from reactions that require modification. Changing building uses can be utilized as well.

### emerge

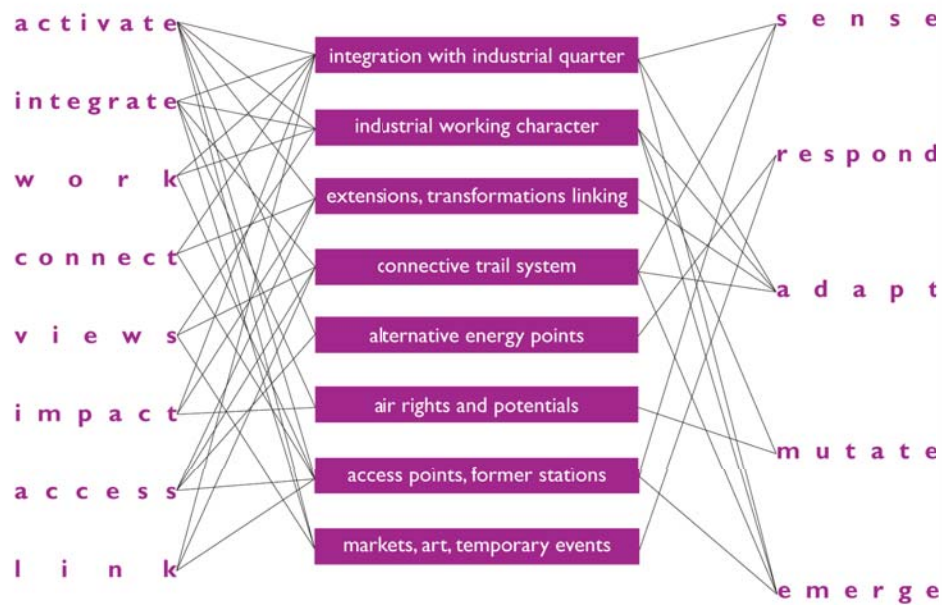
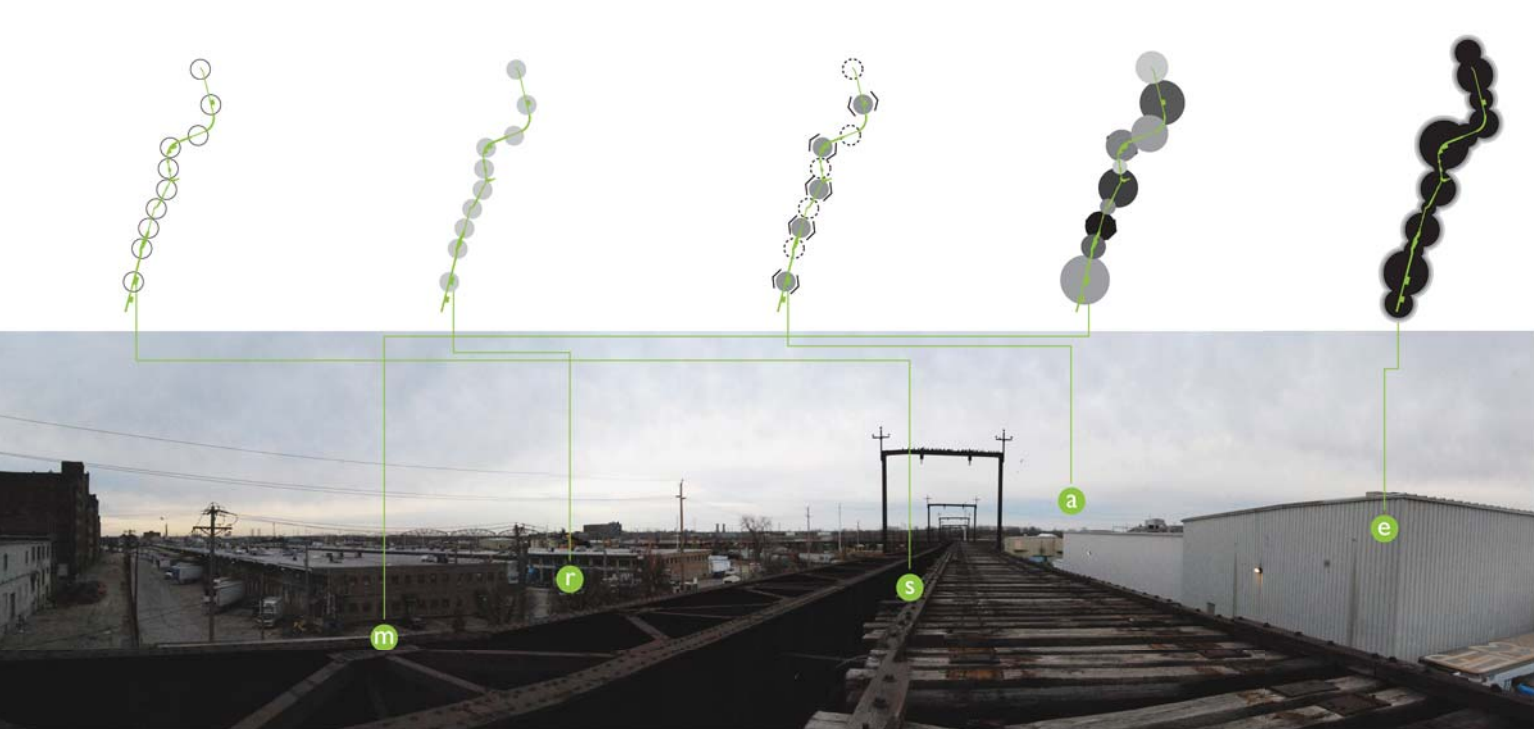
Emergent elements could include the formation of temporary events (festivals, bike races, starting or ending points) linking to permanent connections (trails, linear green open space system).



f 3.37a location plan: program of site three. illustration created by designer 2008







#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 4: elevated commercial district]

### sense

Sensory elements could include embedded sensors within the track line, at or near the site to monitor change, frequency, and rates of usage to determine needs at Trestle level.

### respond

Responsive elements could include implemented or placed sensing devices that allow users to modify patterns, amenities, elements.

### adapt

Adaptive elements could include site features that change with increased or decreased usage.

### mutate

Mutative elements could include site elements change due to necessity.

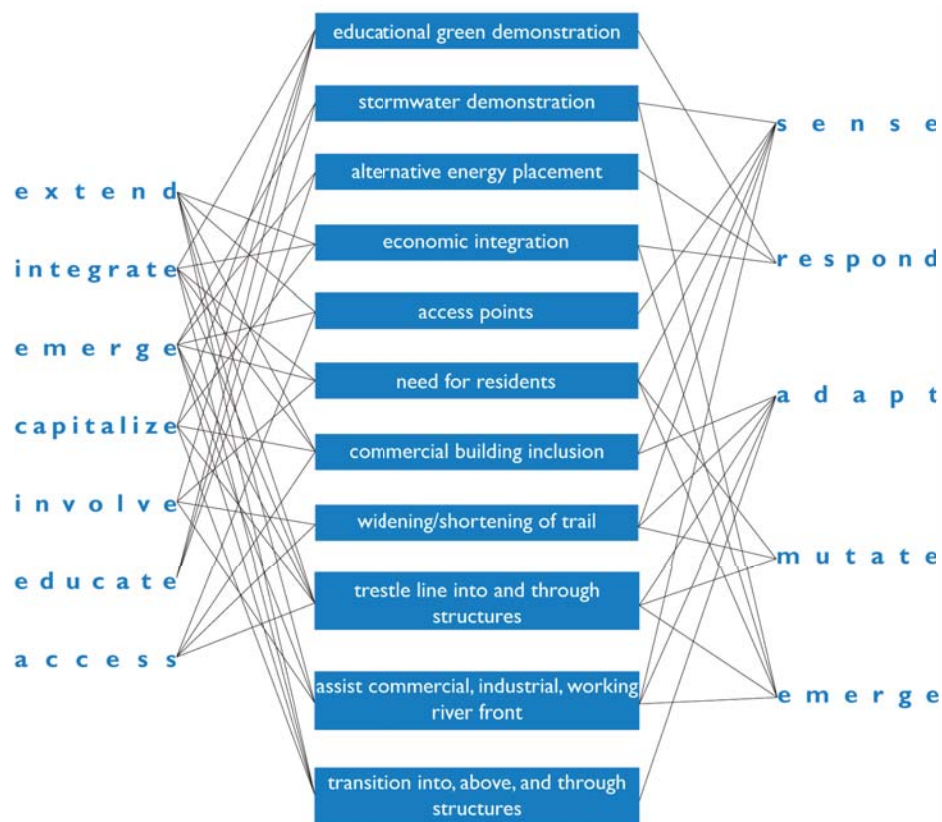
### emerge

Emergent elements could include the formation of temporary events (festivals, bike races, starting or ending points) linking to permanent connections (trails, linear green open space system).



f 3.38a location plan: program of site four. illustration created by designer 2008





#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 5: open space below elevated]

### sense

Sensory elements could include embedded sensors within the rail to monitor traffic, noise, pollution, transient resident, or pedestrian passing Trestle or street level.

### respond

Responsive elements could include sensors monitoring habits and trends to inform access points, media display information, or educational media.

### adapt

Adaptive elements could include elements that extend towards ground level to bring pedestrians up into space that converts when not used for specific purpose, rail lines that changes materials, or reacts in response to weather changes.

### mutate

Mutative elements could include appendages that transform gradually over time.

### emerge

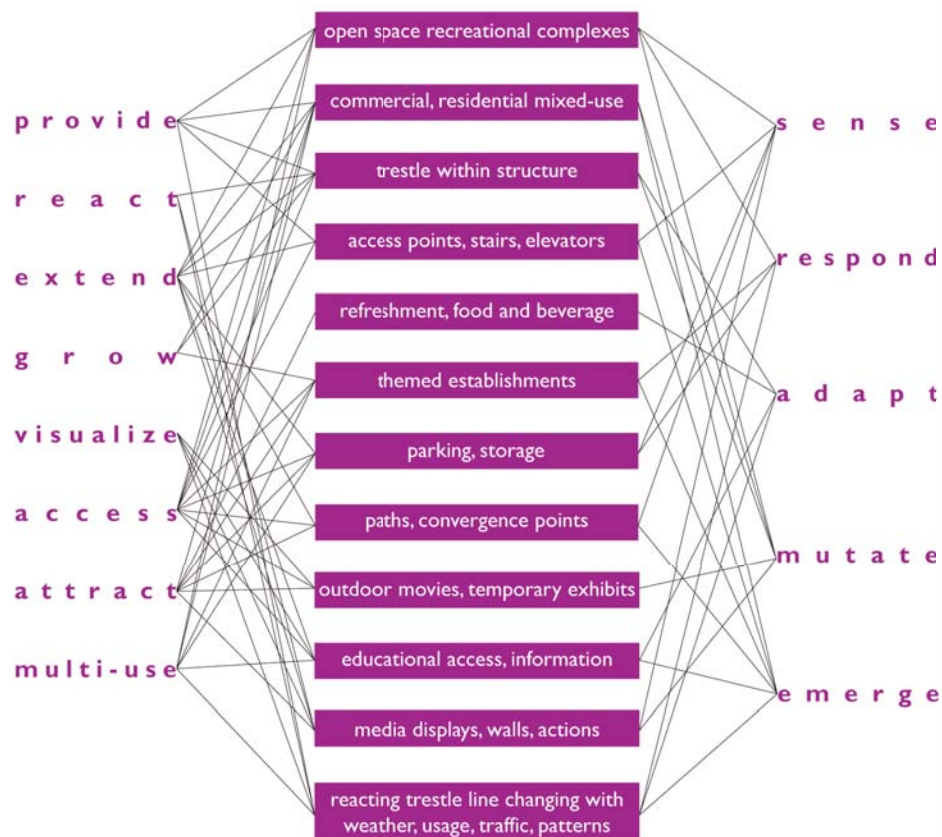
Emergent elements could include functional necessities, outdoor gathering locations, or on-site energy generation.



f 3.39a location plan: program of site five. illustration created by designer 2008







#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 6: the bridge]

### sense

Sensory elements could include embedded sensors within the rail or bedding, gates or entry points affected by traffic, noise, pollution, transient resident, or pedestrian passing.

### respond

Responsive elements could include sensors monitoring habits and trends to inform educational opportunity, media that could be 'plugged' into, or wireless equipment that enables decision making.

### adapt

Adaptive elements could include elements that extend outwards or into bridge from exterior. Rails and bedding could change material to accomodate for temporary events and changes. Weather could also affect rail line.

### mutate

Mutative elements could include rail structures that accomodates increased use, changes into shelter or seating, or extends appendages enabling movement to and from site.

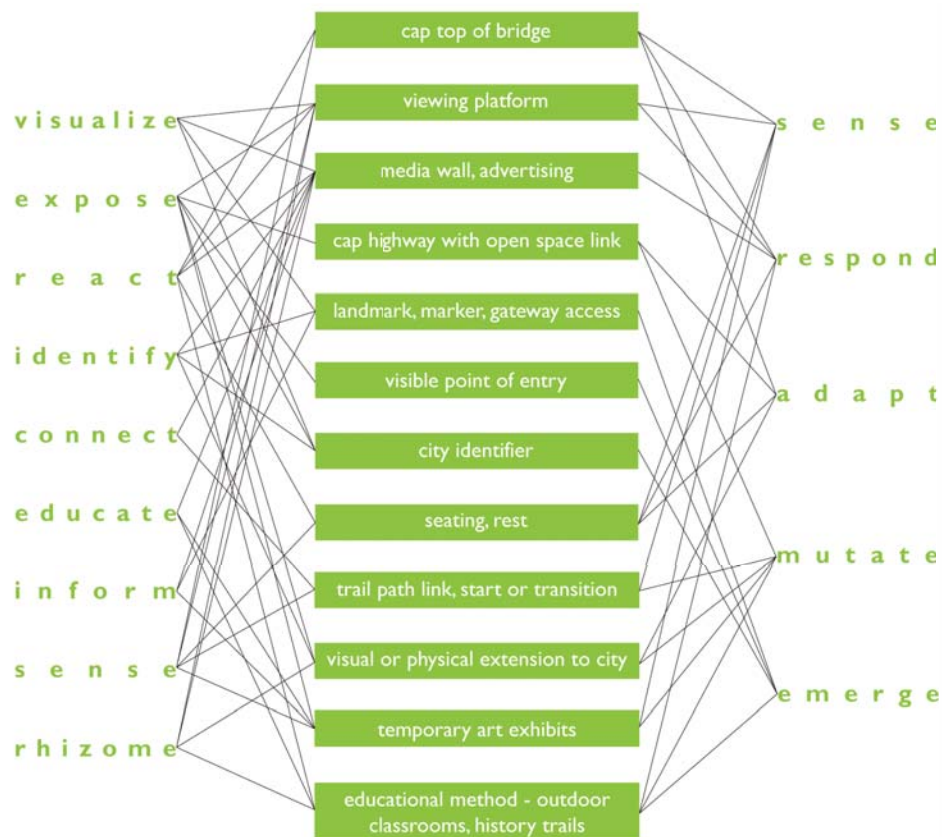
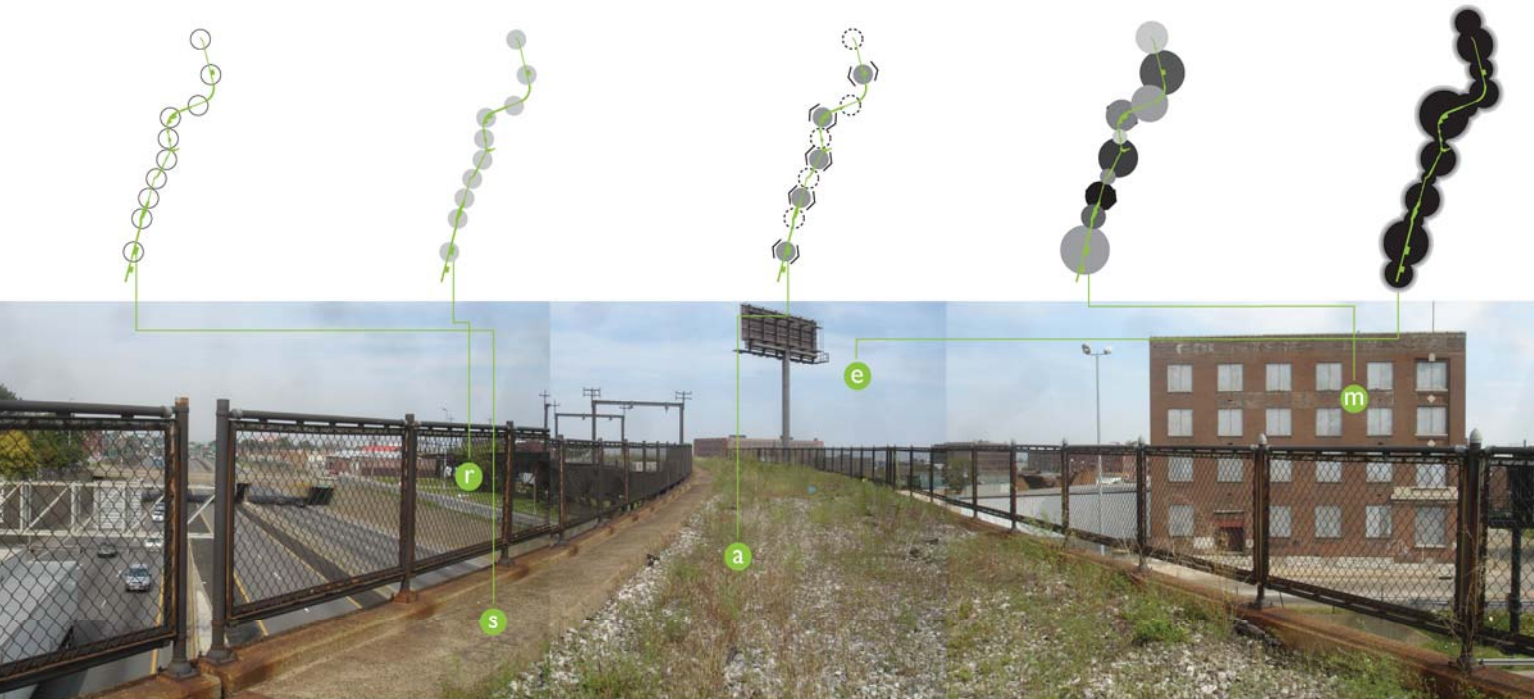
### emerge

Emergent elements could include vegetation that become alive (living walls), rails with mutating elements that could leave or grow depedent on use, or rail lines extending into or from structures dependent on usage or lack of usage.



f 3.40a location plan: program of site six. illustration created by designer 2008





#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential



## program [site 7: elevated to ground transition]

### sense

Sensory elements could include embedded sensors within the vegetation and rail as well as exposing elements such as visual media.

### respond

Responsive elements could include sensors within revamped line that indicate usage patterns and then transform over time.

### adapt

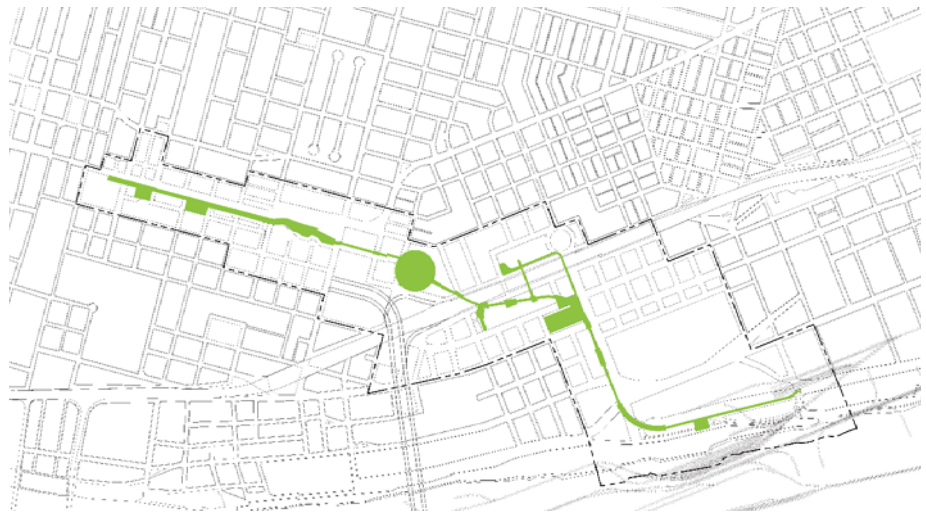
Adaptive elements could include site amenities and rail structures that translate or evolve into functional site elements.

### mutate

Mutative elements could include rail structures that accomodate increased use, change into shelter or seating, or open space patterns that could serve multiple purposes.

### emerge

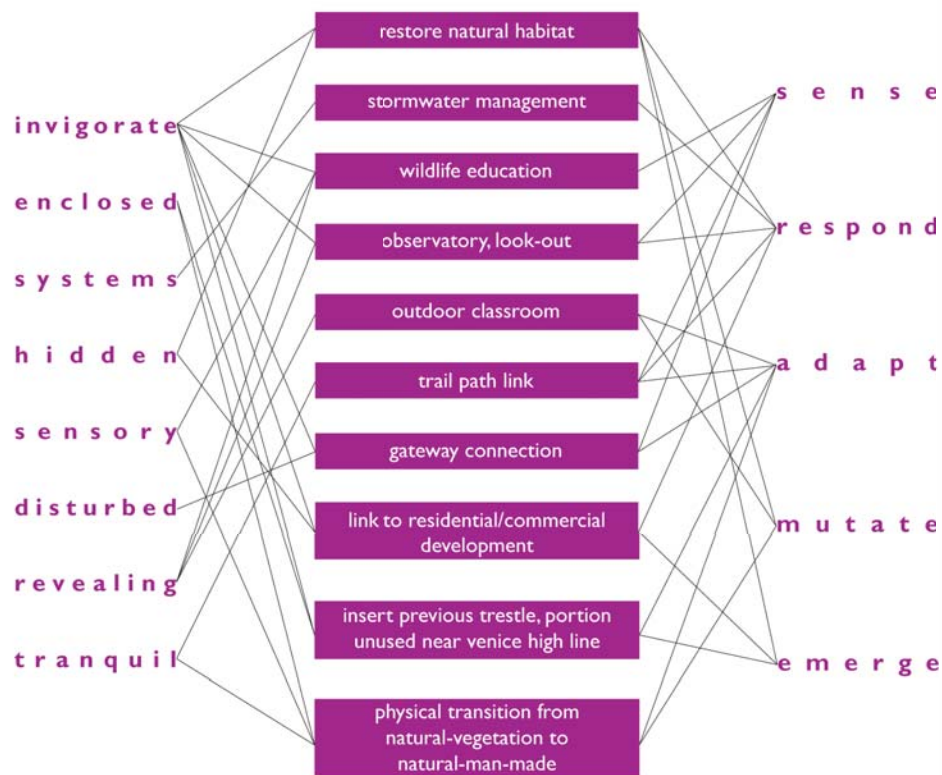
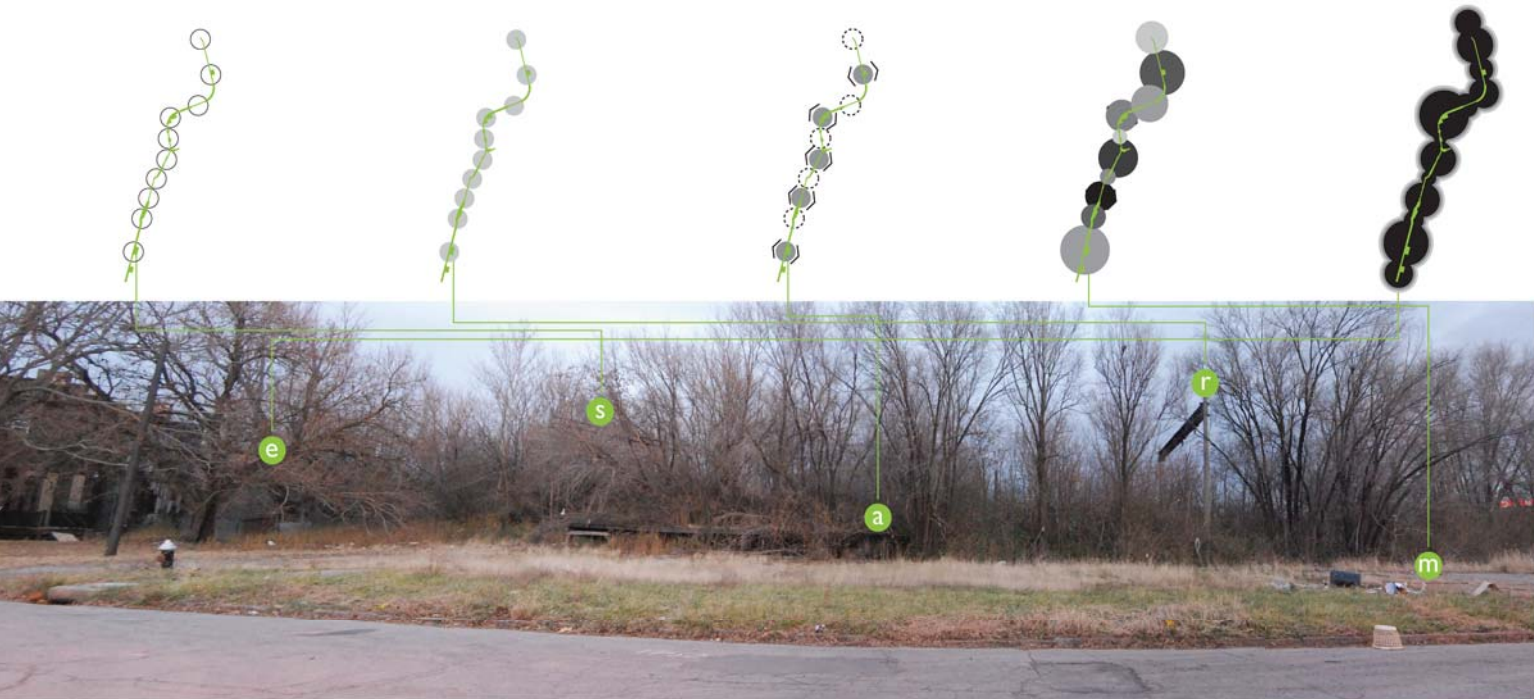
Emergent elements could include vegetation that could become living walls, rails with mutating elements that could leave or grow deperdent on use, or rail lines extending into or from commercial structures dependent on usage or lack of usage. Reused site elements could be integrated into the site's fabric to stimulate use or draw visitors to location.



f 3.41a location plan: program of site seven. illustration created by designer 2008







#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 8: ground level trackage]

### sense

Sensory elements could include embedded sensors within the track line or close to site to gauge pedestrian use and vehicular presence.

### respond

Responsive elements could include embedded sensors in ground or structure reacting to increased or decreased use.

### adapt

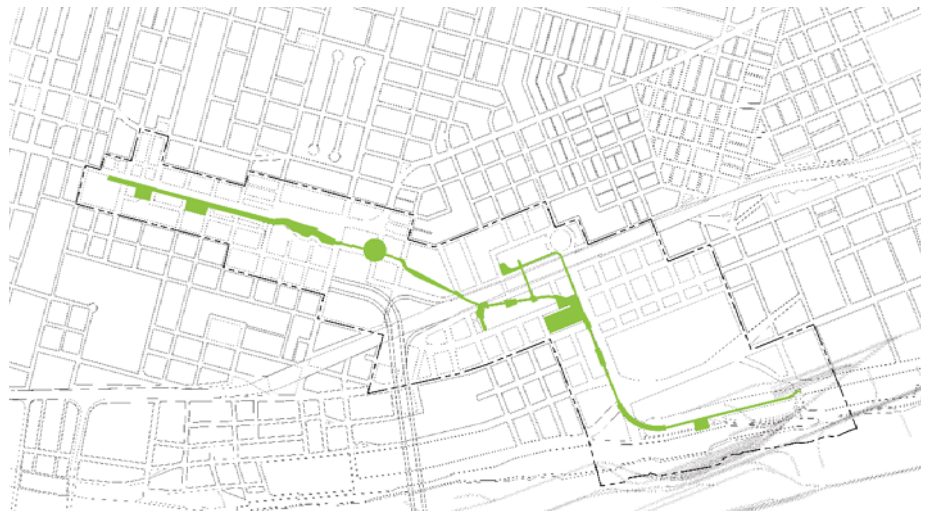
Adaptive elements could include gauging elements that translate information into potential functional structure.

### mutate

Mutative elements could include site elements that change from initial use of seating, recreation, or rest into temporary or permanent places of leisure and residency.

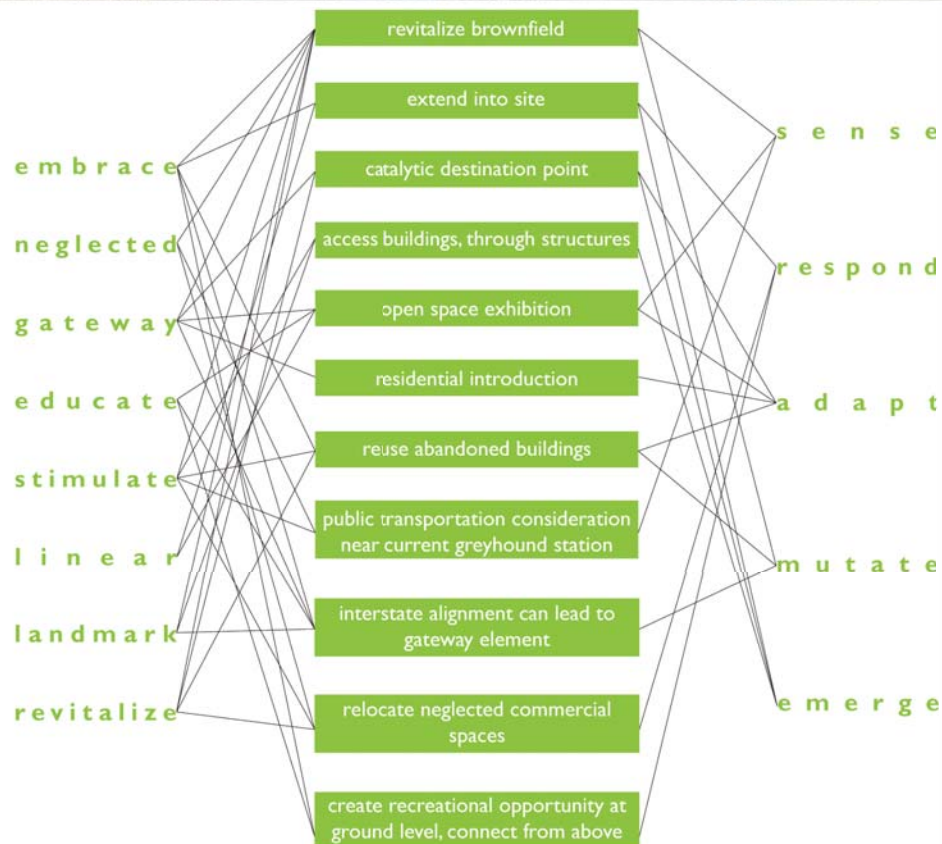
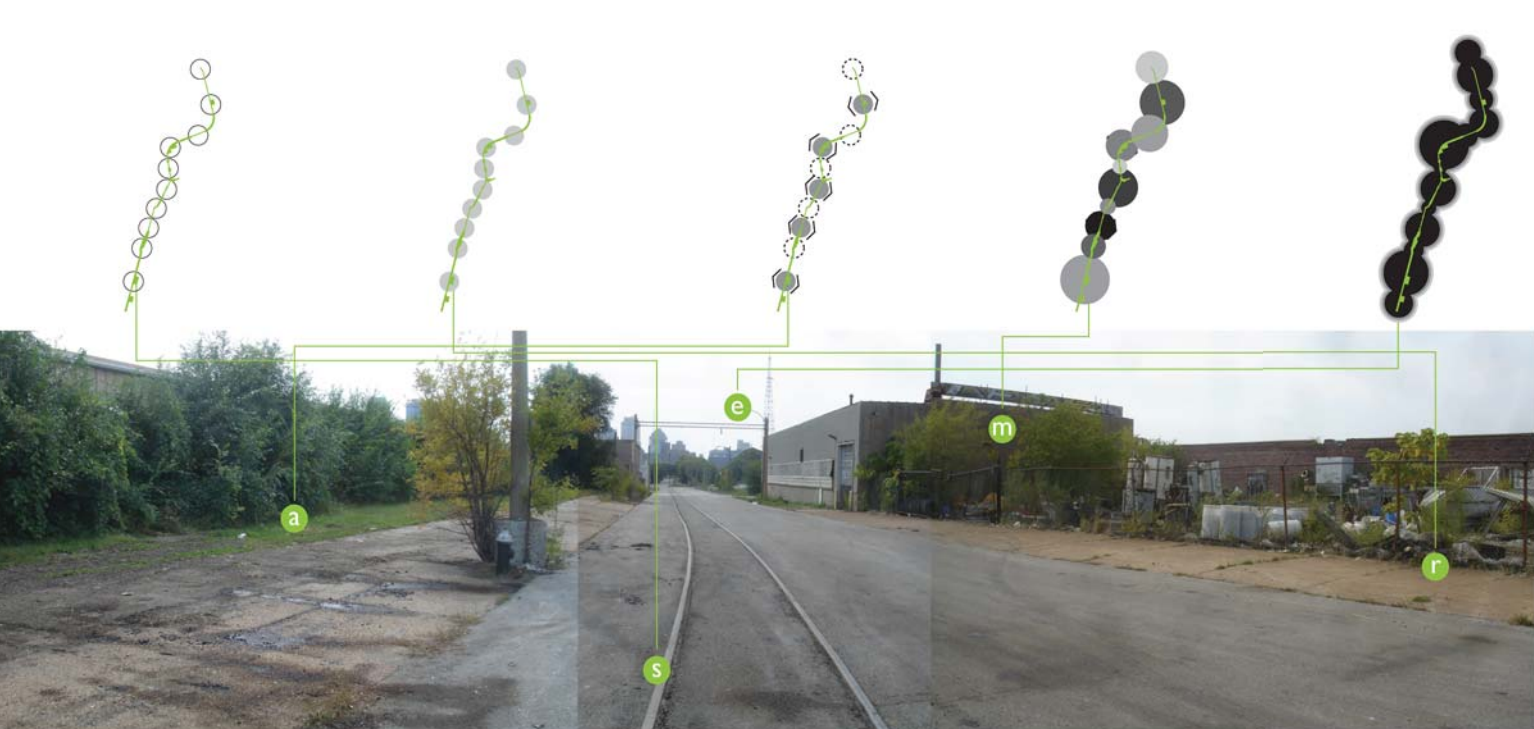
### emerge

Emergent elements could include the formation of temporary events (festivals, bike races, starting or ending points) linking to permanent connections (trails, linear green open space system).



f 3.42a location plan: program of site eight. illustration created by designer 2008





#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential



## program [site 9: subway transition entrance]

### sense

Sensory elements could include embedded sensors within subway corridor, information collection at street level and within Trestle steel, or traffic sensors to monitor volume.

### respond

Responsive elements could include fixtures or site elements that react to pedestrian movement after information collection specifically at sidewalk and street corner.

### adapt

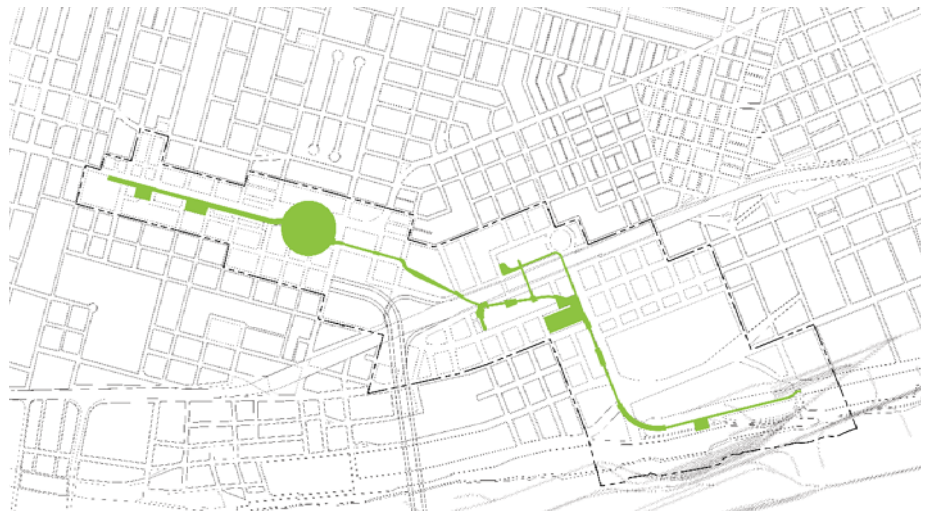
Adaptive elements could include site elements that change with unpredictable program such as seating, shelter, or extendable covers.

### mutate

Mutative elements could include seating that transforms into responsive shelters, energy collectors, or embedded sensors changing into alternative energy distributors.

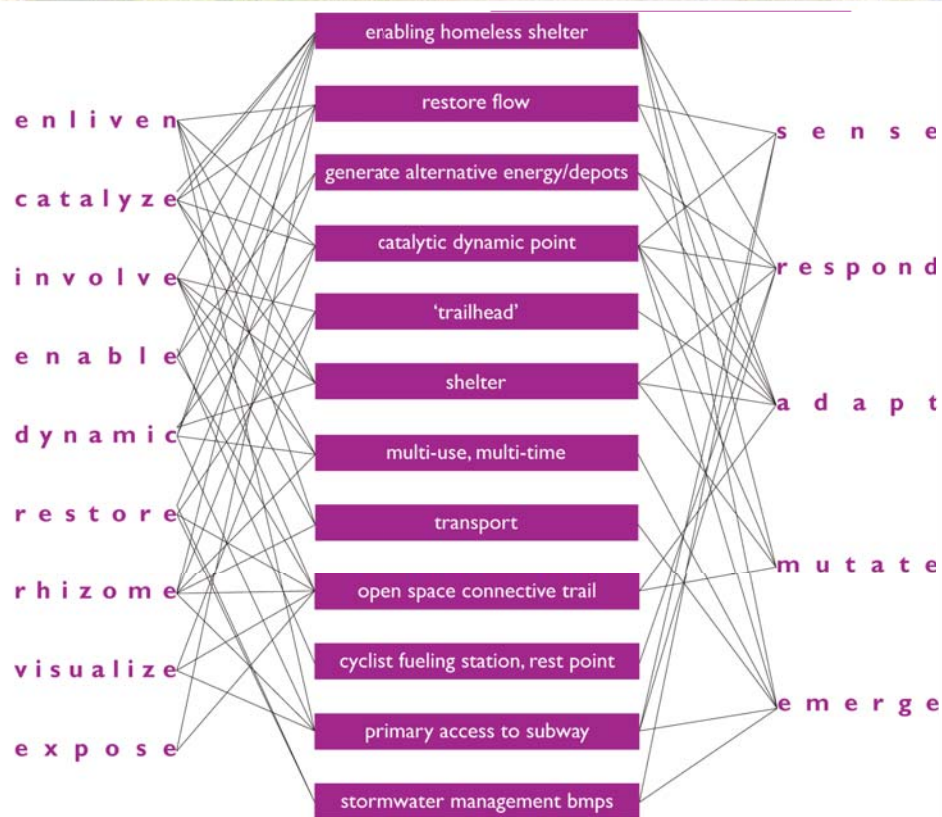
### emerge

Emergent elements could include Trestle elements left on site transforming into functional portions, commercial or residential potentials below grade, exposure of the subway's historical presence below Tucker-14th to a street level visibility, or completely plant the area to enable an eventual transformation into a stormwater BMP collection point.



f 3.43a location plan: program of site nine. illustration created by designer 2008





#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [site 10: underground subway-street extension]

### sense

Sensory elements could include embedded sensors along and within the subway line, information collection at the street level of pedestrian points of congregation, or traffic sensors to monitor usage and volume.

### respond

Responsive elements could include fixtures or site elements that react to pedestrian movement after information collection specifically at sidewalk, street, rail, or subway level.

### adapt

Adaptive elements could include responsive elements that had previously sensed places of pedestrian congregation or areas with few inhabitants that would shift into functional structures (i.e. shelters, covers, seating, temporary event space).

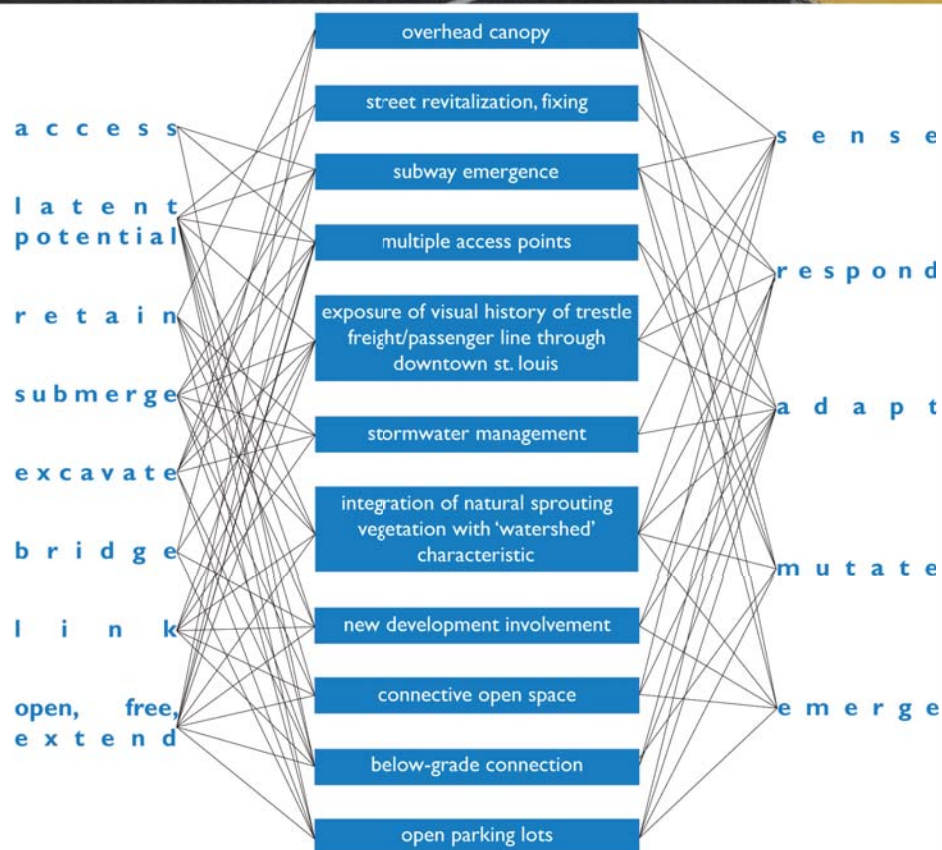
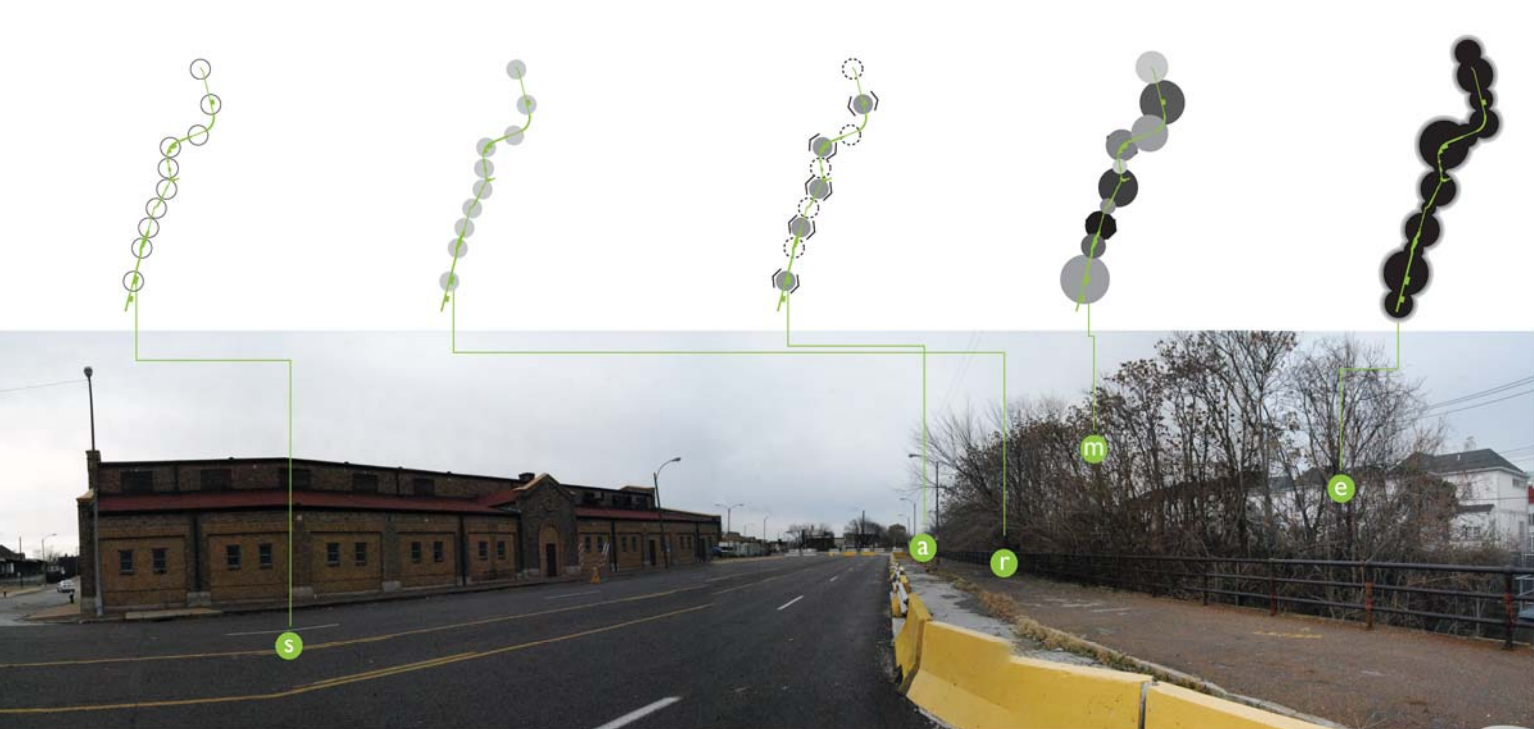
### mutate

Mutative elements could include adaptive elements that have evolved with use or lack of use. Shelters could become temporary housing or places for potential residents extending to local redevelopment initiatives and transforming from static to dynamic function.

### emerge

Emergent elements could include hard or soft scape unpredictabilities changing use or function over time, established elements transforming hidden potential into functional capability, creating temporary or permanent exhibition, or changing from site element into city feature or landmark.





#### color rating legend

- High issues-constraints/low potential
- Medium issues-constraints/medium potential
- Low issues-constraints/high potential

## program [conclusions]

The suggestive locations for implementing the S.R.A.M.E. Strategy indicate sensory elements can first be embedded within the actual Trestle line. Responsive devices must be close by as they are reaction to the external stimuli. Adaptive elements can be on-site or in close proximity as they are evolving responsive systems. Mutative elements are reactions to use, lack of use, physical changes, and sensory elements initiating a transformation or disfiguration over time. The real-time sensory, responsive, adaptive, and mutative elements have no time frame but are directly related to the success of an emergent system. The elements occur directly on the Trestle while their repercussions are felt off-site in the emergent connections, links, and interrelated systems.

The program phase of the *discover* process translates keyword generation to actual design elements, connecting abstract idea-tages to functional design solutions.







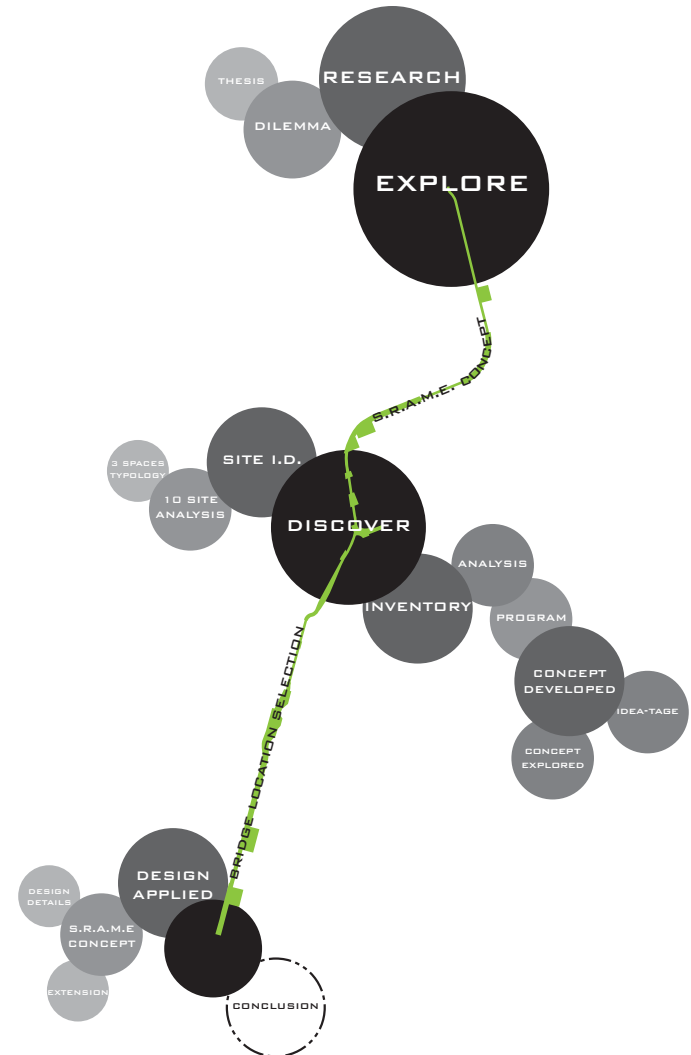
C O N C E P T



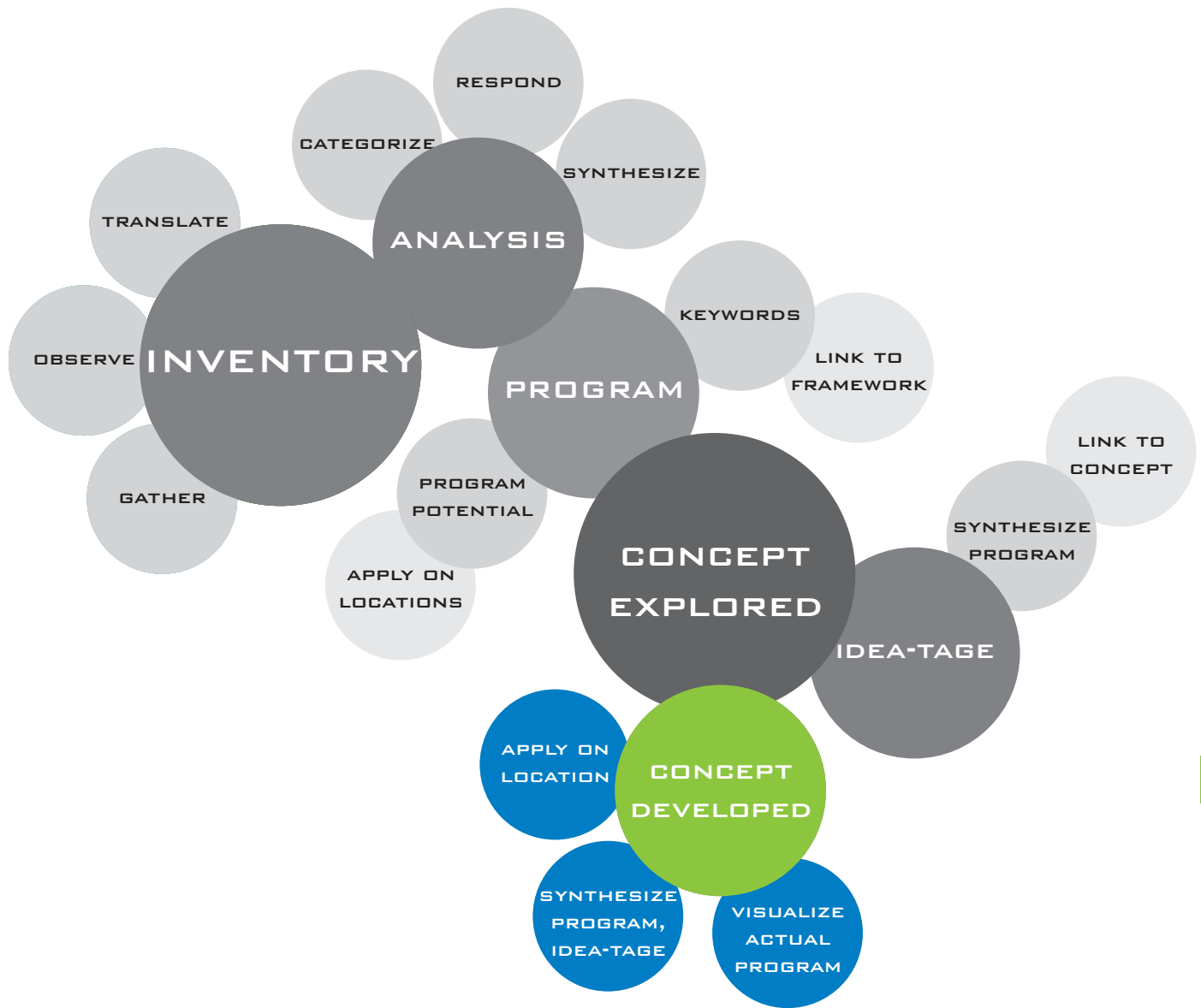
Conceptual development synthesizes all acquired information, from site information gathering, observation, and translation; individual site character-type analysis; abstract idea and keyword generation; and programmatic element and location suggestions into workable strategies. The site inventory located the three structural character types and ten individual sites; the site analysis revealed potential options, issues, and constraints for future designs; and the abstract idea-tages provided keyword generation that led to the formation of programmatic strategies. Conceptual development visualizes the site's potential application of the S.R.A.M.E. Strategy.

### process philosophy

The concept phase of the *discover* process is the final step in visualizing site potential. The visualization of each site leads to the creation of an interconnected system applying *sensory, responsive, adaptive, and mutative* strategies enabling the evolution of future *emergent* systems.





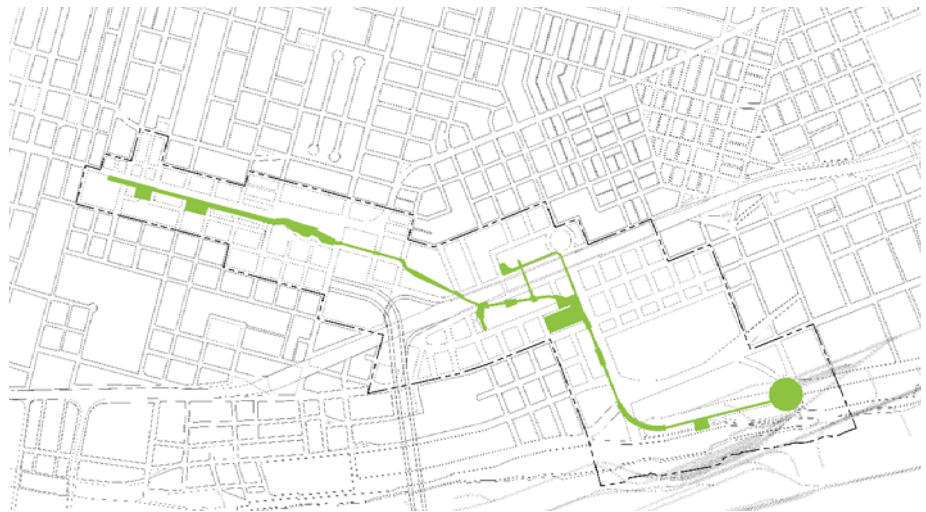


## concept [site 1: gateway]

The initial link into the Trestle site will serve as an identifying gateway, marking the trail, connecting to the existing fabric, and branding the site.

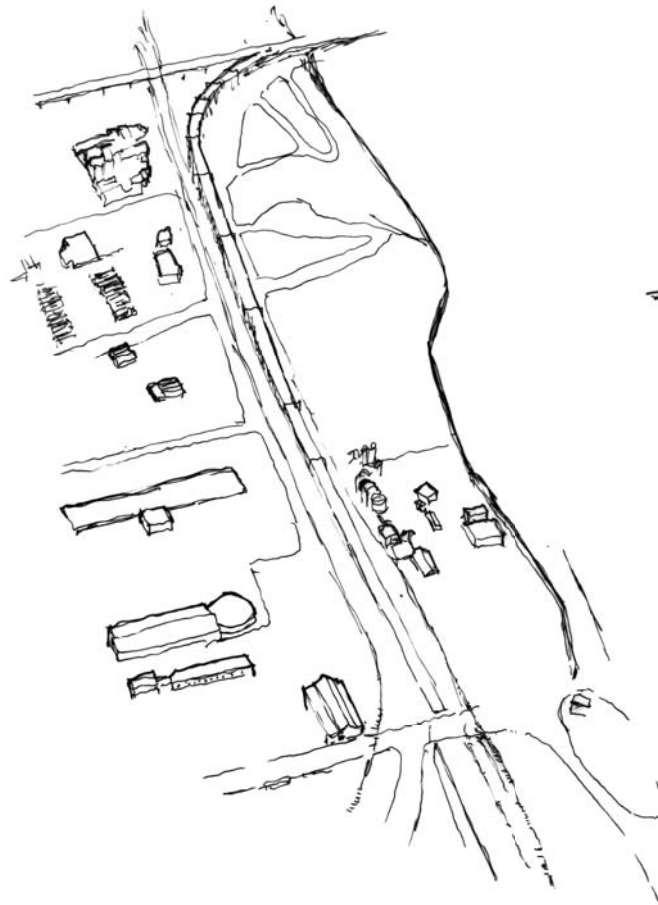
### **s.r.a.m.e. applied: initiate**

The transforming mechanism integrates the existing industrial context, creates entrance points along the riverfront trail, and focuses on the creation of views and vistas. Embedded sensors within the catenaries and trail pavers can respond to changes over time. Functional and structural stability must also be established.



f 3.46a location plan: concept of site one. illustration created by designer 2008





## concept [site 2: elevated working riverfront]

The elevated riverfront portion of the Trestle extends the initial entry point south of the Branch Street Trestle by connecting the user from the street level and onto the line.

### **s.r.a.m.e. applied: connect**

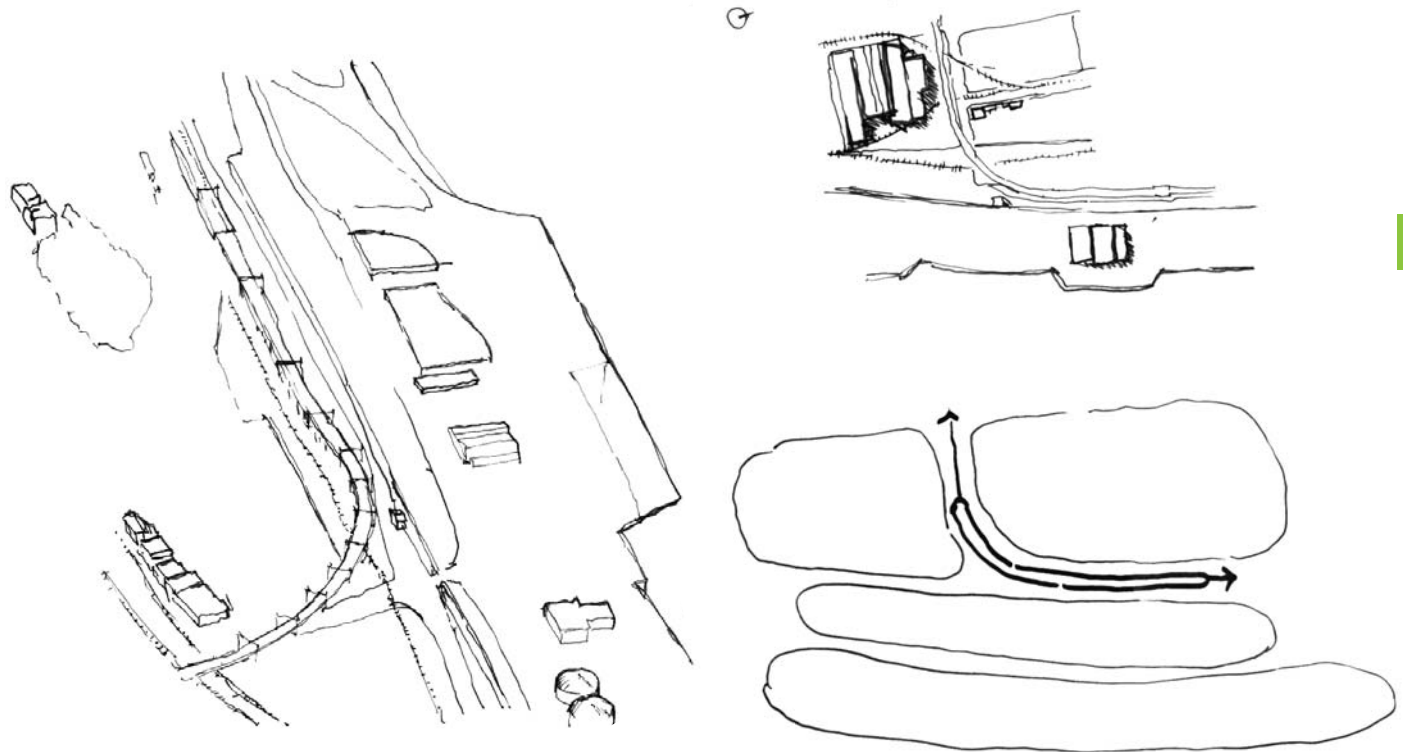
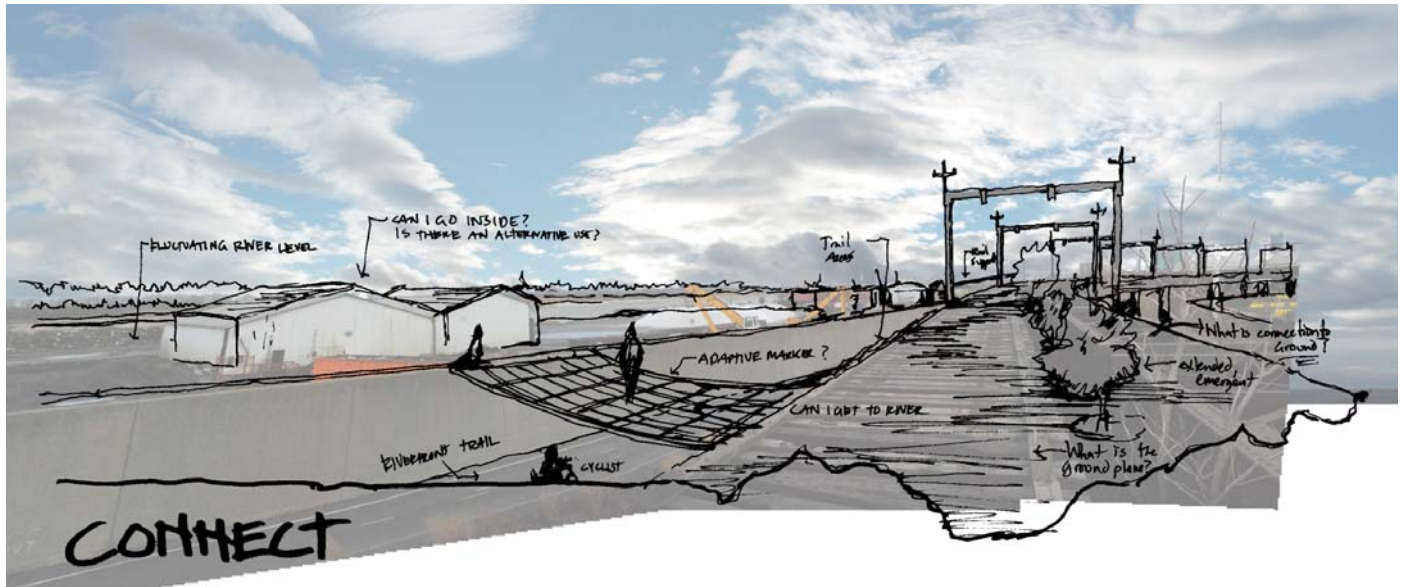
The transforming mechanism will extend a living landscape or temporary structure that can serve as kiosk and social learning center. The extension to the river will change the static Mississippi into a dynamic ecosystem. Recycling and waste facilities can be incorporated into the Trestle system, integrating the existing fabric and involving the primarily industrial front.



f 3.47a location plan: concept of site two. illustration created by designer 2008







## concept [site 3: elevated industrial quarter]

The elevated industrial quarter activates and makes the Trestle accessible by transforming and bringing people into and onto the structure.

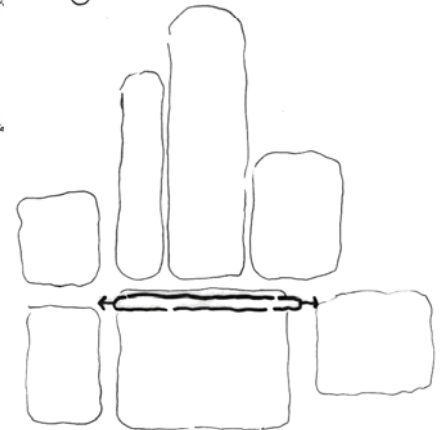
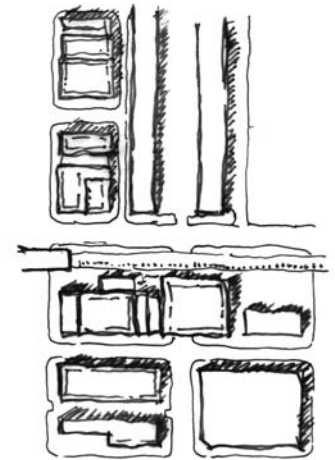
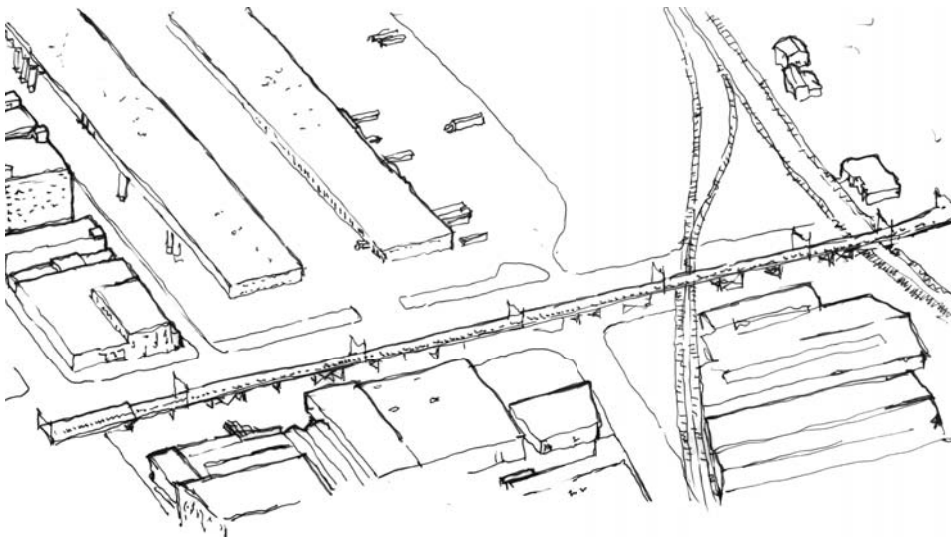
### **s.r.a.m.e. applied: activate**

By enabling views, transforming the place for a usable space for active and passive users, and creating accessible locations along the line, the Trestle will integrate physical and visual measures to involve the local community. Elevators, ramps, and stairs will pull people up into the site. The temporary ad hoc parking occurring below the Trestle needs to be addressed as easement rights do not belong to the city. Vehicular and pedestrian considerations can still be integrated within or in close proximity to the site.



f 3.48a location plan: concept of site three. illustration created by designer 2008





## concept [site 4: elevated commercial district]

The physical introduction of the rail into the commercial structures can extend the Trestle and fully integrate into an emergent rooftop system.

### **s.r.a.m.e. applied: extend**

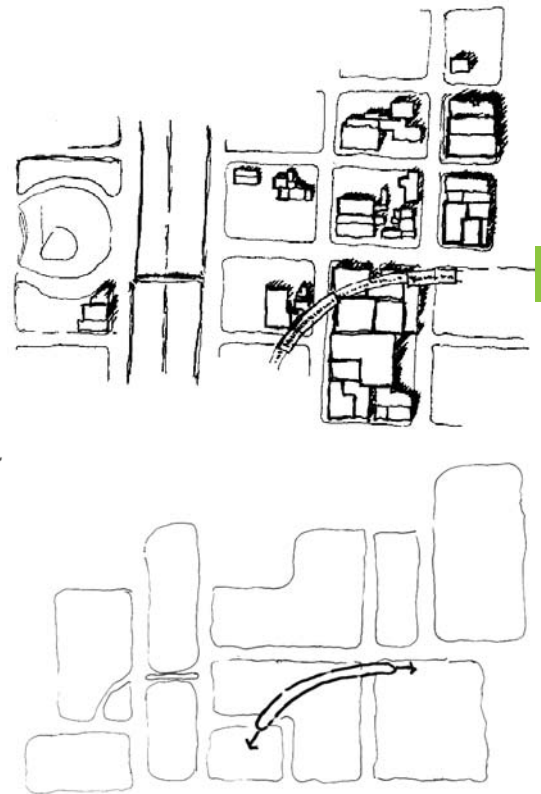
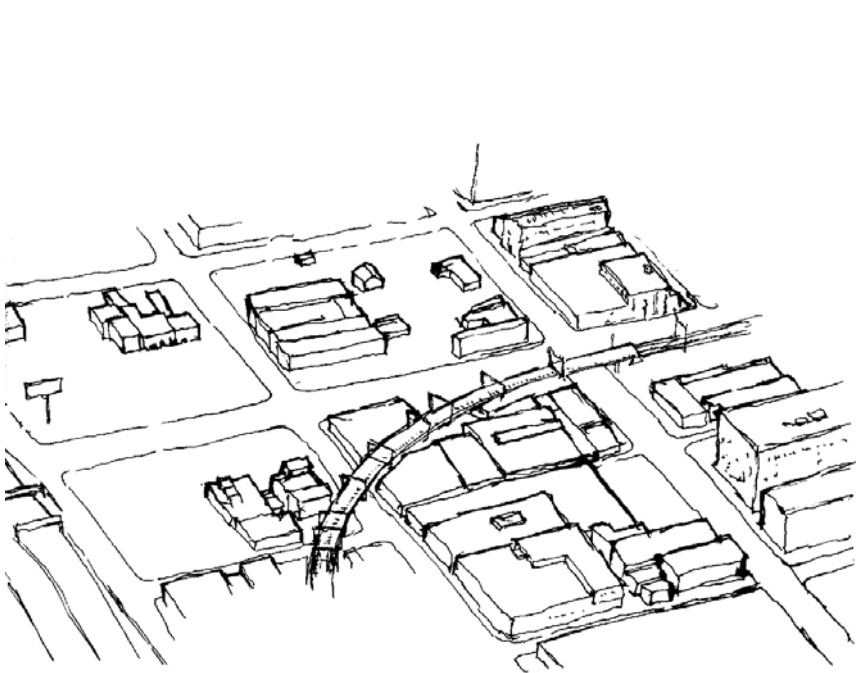
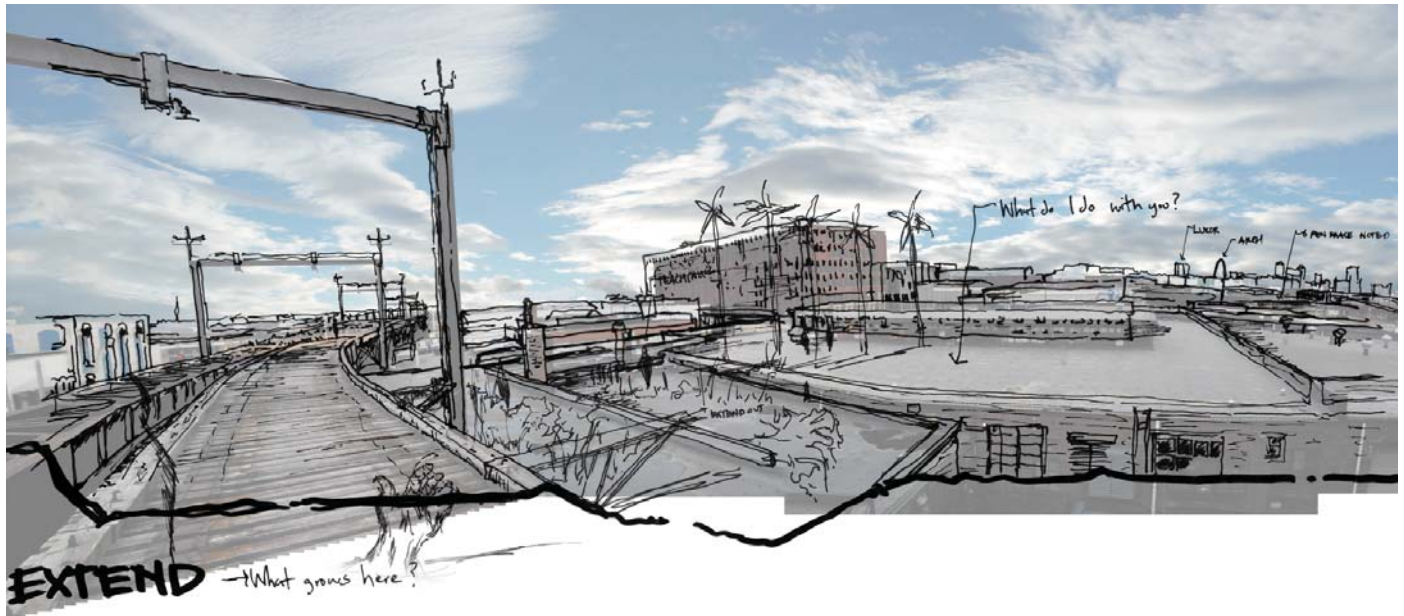
Physical extension will serve as the initial response to an intelligent system. The emergence of a sustainable design that integrates the economical and social conditions will focus on revitalizing neglected structures, bringing people back into the area, and focusing on making the trail visually extend and impact.



f 3.49a location plan: concept of site four. illustration created by designer 2008







## concept [site 5: open space below elevated]

A spreading oasis in the midst of urban chaos, the establishment of a renewed open space system will redefine the meaning of contemporary parks benefitting and providing for its user.

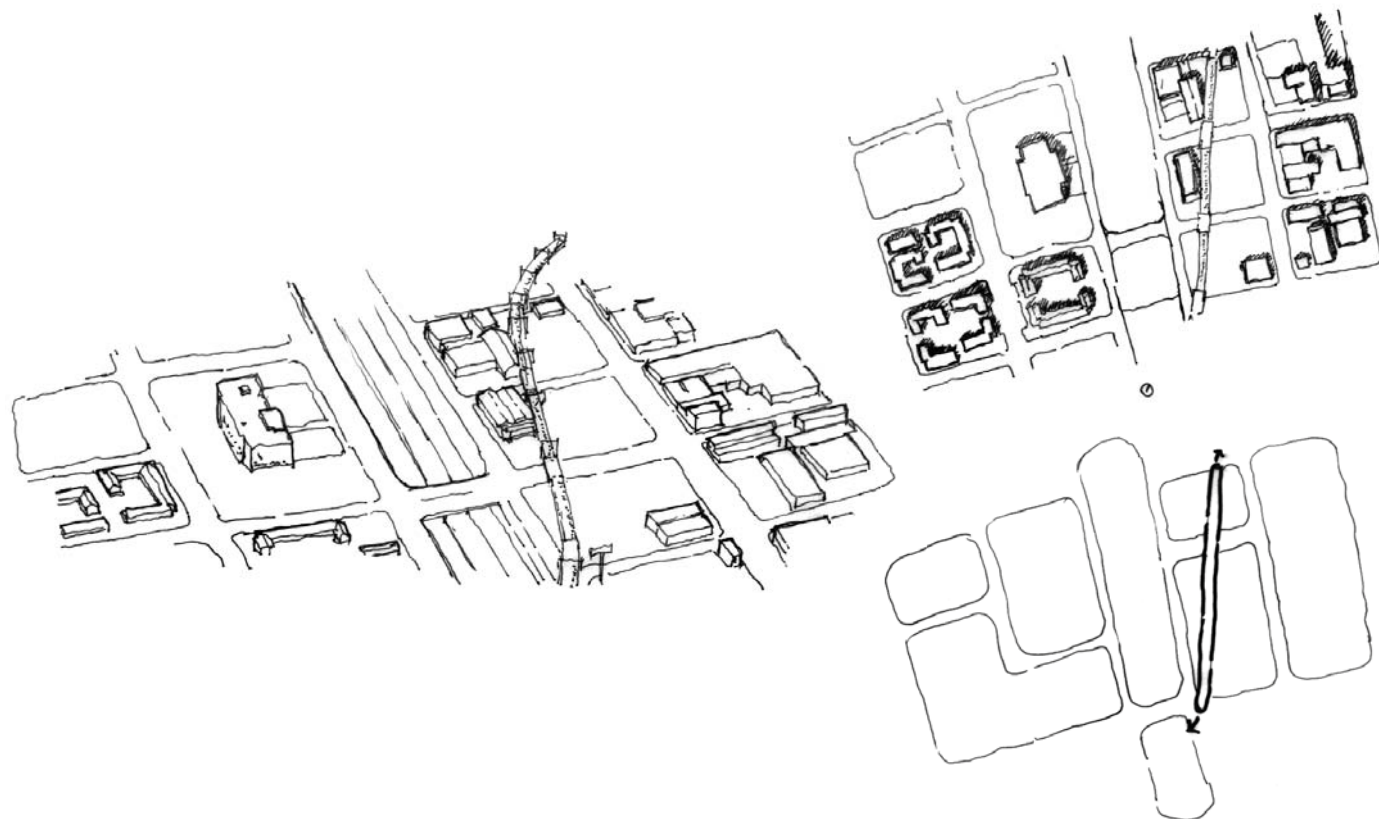
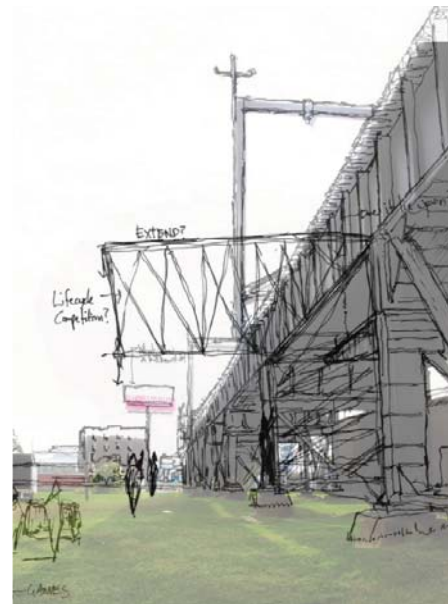
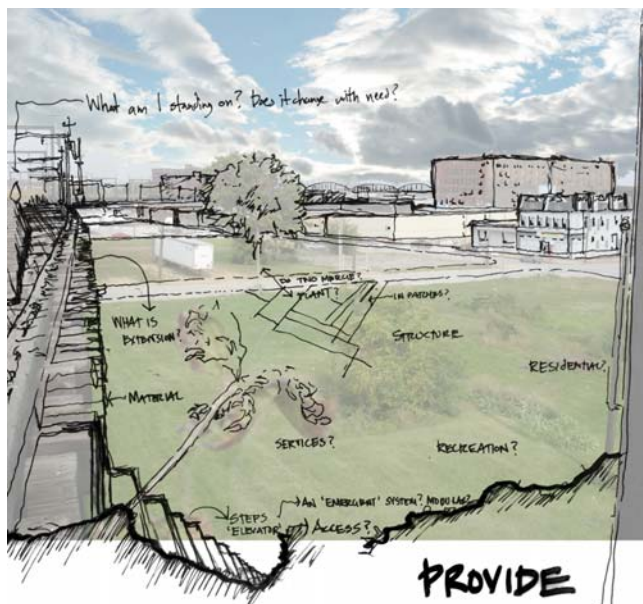
### s.r.a.m.e. applied: provide

Establishing a link from the Trestle to the open space below will be critical in forming an evolving open space system. Integrating vacant buildings, visualizing the system's presence, and creating options over time will display the potential application of the emergent system.



f 3.50a location plan: concept of site five. illustration created by designer 2008





The most significant physical structure will fully engage the Trestle user and city of St. Louis by visualizing its presence immediately.

**s.r.a.m.e. applied: visualize**

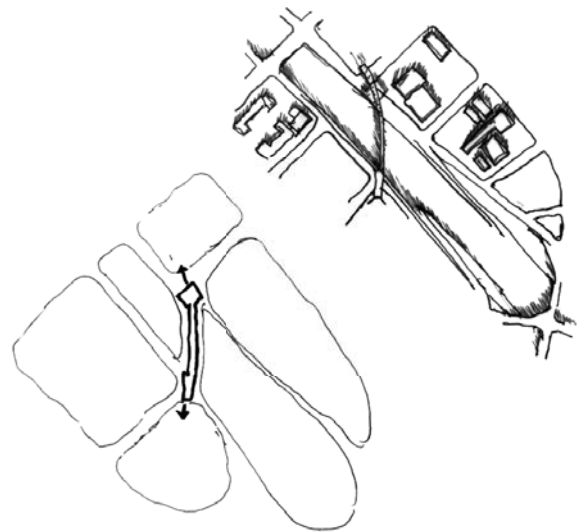
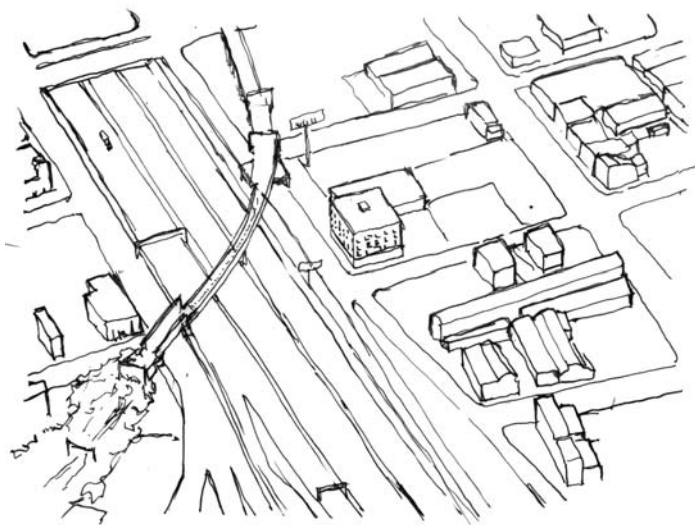
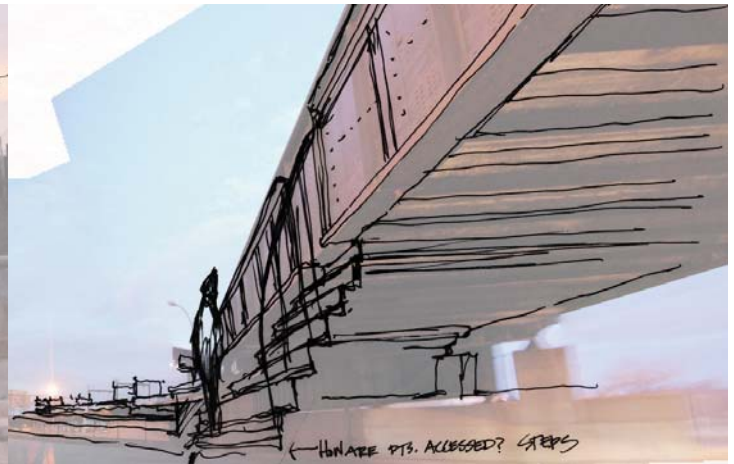
Digital media application, living walls, visual-auditory devices, and thematic branding agents will create an immediate visual and physical presence for the Trestle's users. Educating elements such as outdoor classrooms, art displays, temporary exhibits, or permanent events can be established to connect and revive the Trestle line. Sensory mechanisms can, similar to the methods in the *Minority Report*, respond to users' needs, gathering data, and translating information into functional solutions. Stimulating development directly on the Trestle will influence adjacent emergent systems, revitalizing and encouraging residential growth, and enabling a link to form from the open space to the scrub vegetation traversing the interstate.



f 3.51a location plan: concept of site six. illustration created by designer 2008







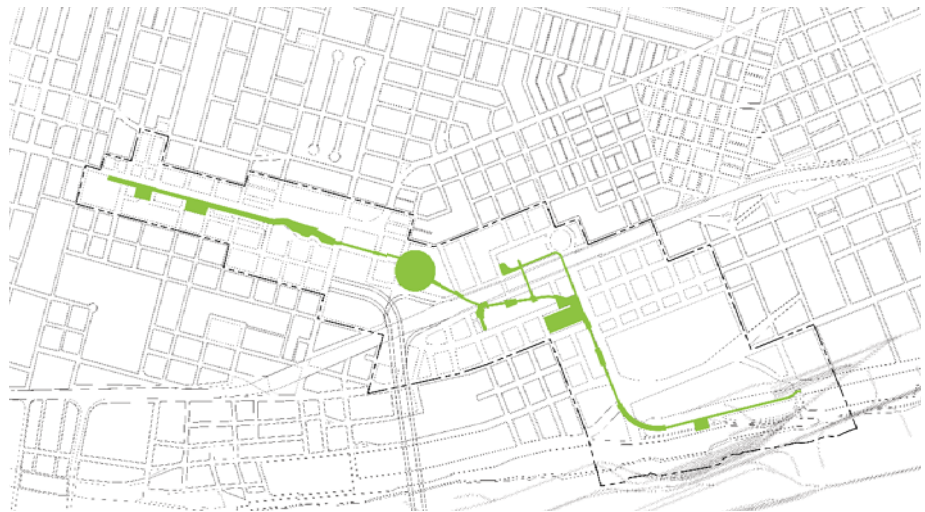
f.3.51b conceptual design for site six. sketch composited by designer 2009

## concept [site 7: elevated to ground transition]

If landscape can serve as structuring element, an emergent landscape can invigorate the residential and commercial base for the Trestle.

### **s.r.a.m.e. applied: invigorate**

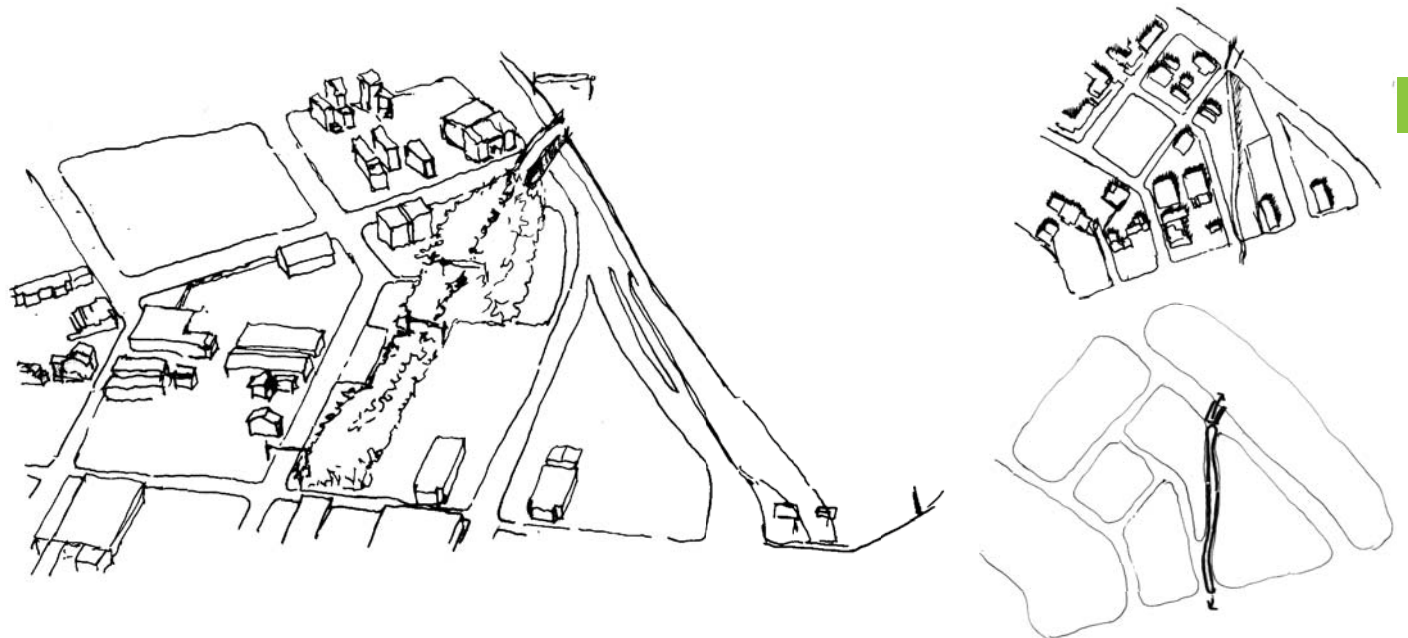
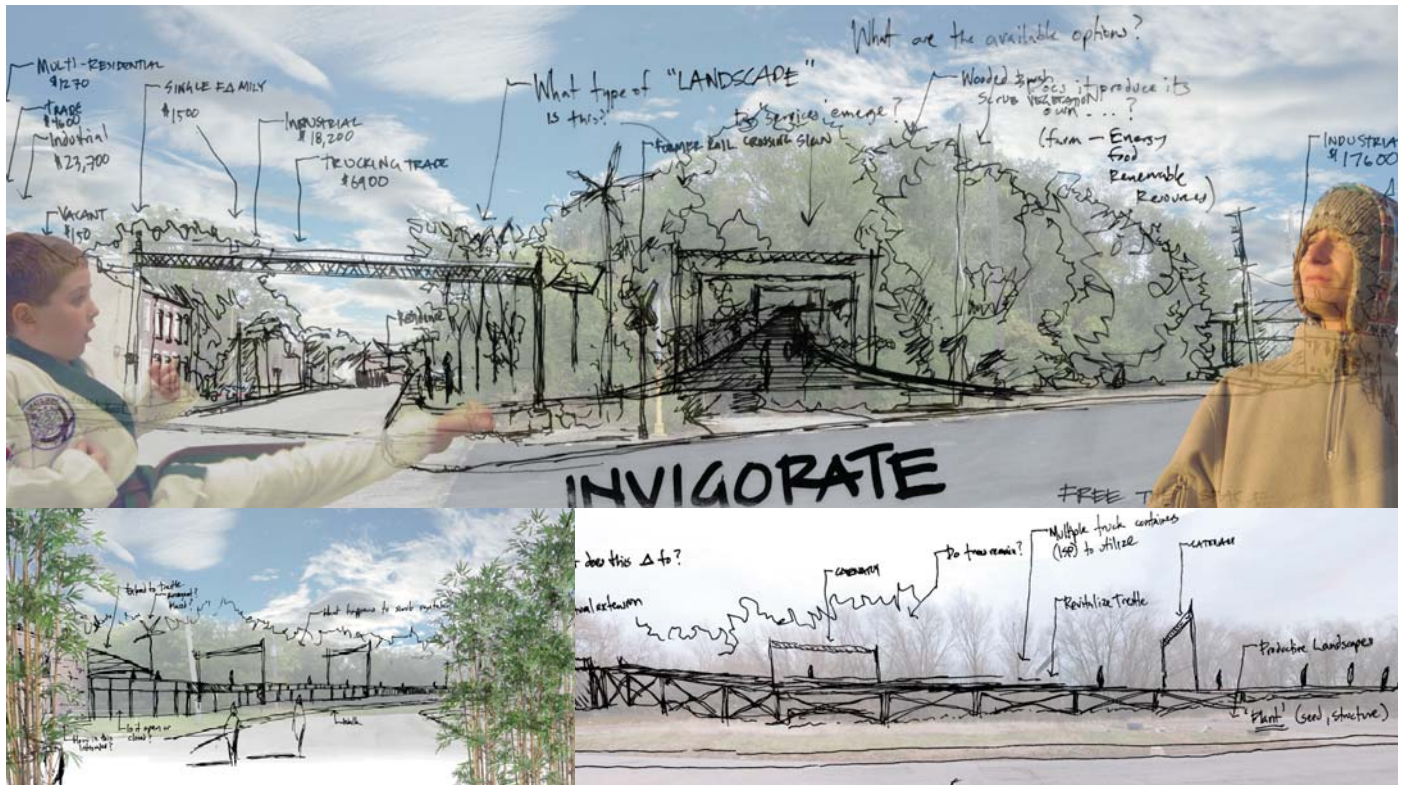
Renewable resource growth, urban agriculture systems, street and corner presence, and development within and through existing structures will enable the growth of an emergent system. Reusing abandoned structures - such as the Venice High Line - will invigorate growth and development over time. Open space links will be influenced by the construction along the Trestle line. The abandoned school west of the interstate can stir educational development.



f 3.52a location plan: concept of site seven. illustration created by designer 2008





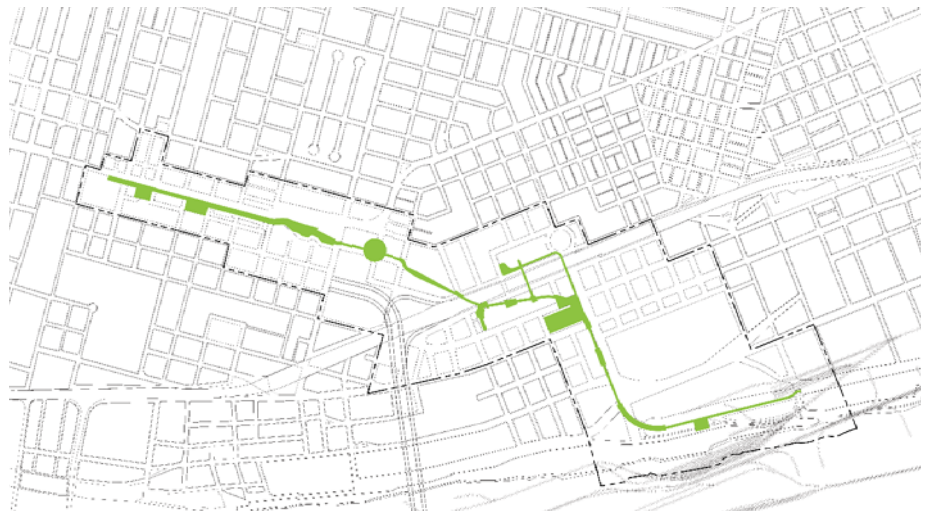


## concept [site 8: ground level trackage]

Developing economic incentives and taking advantage of existing context embraces the old and fuels the new.

### **s.r.a.m.e. applied: embrace**

Emergent economic boosters will invigorate the brownfield and introduce future residents into a revived mixed-use community. Connecting to the residential district to the north, extending the Trestle into and throughout the site to create visual and physical presence, and creating an open space link will encourage long-term, sustainable growth.



f 3.53a location plan: concept of site eight. illustration created by designer 2008





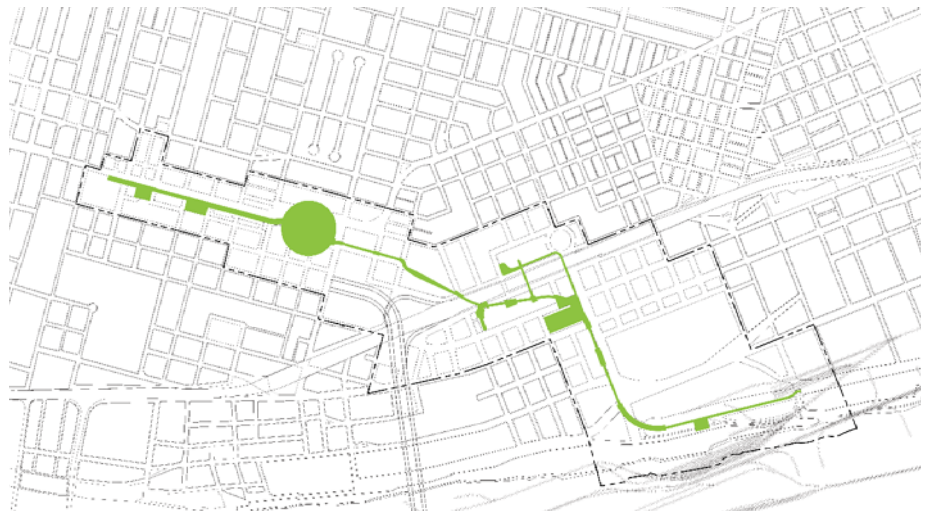


## concept [site 9: subway transition entrance]

Converting the abandoned subway system will enliven and expose the latent potential.

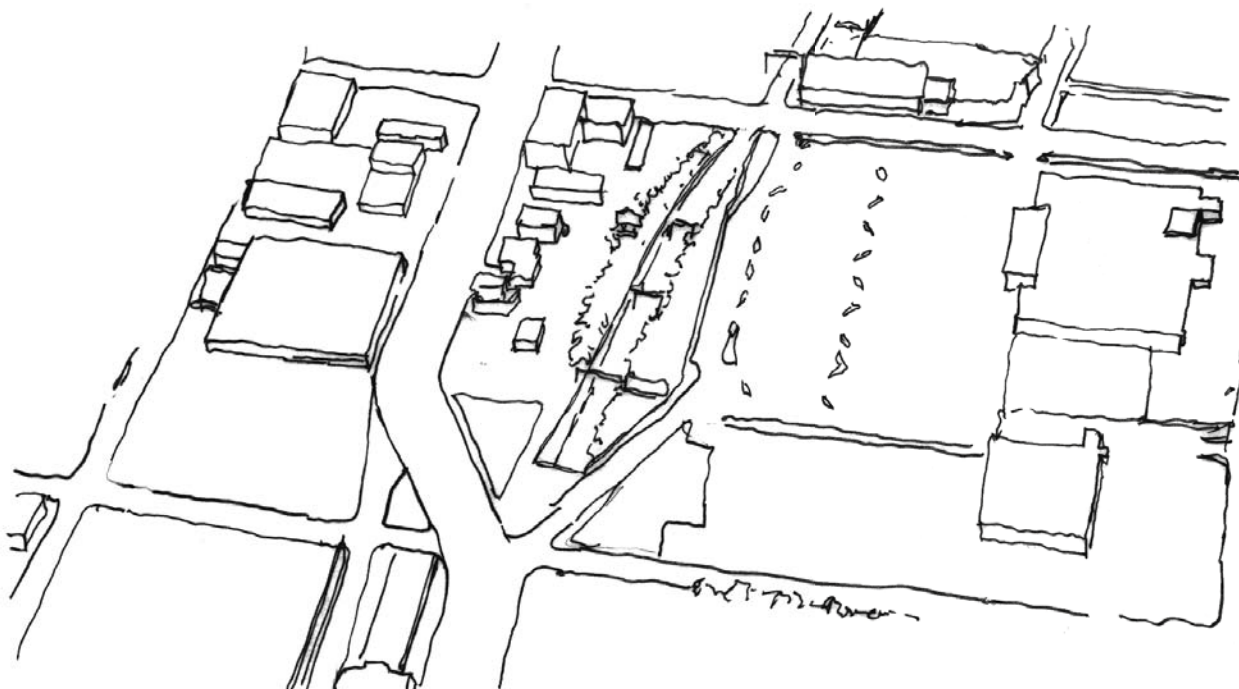
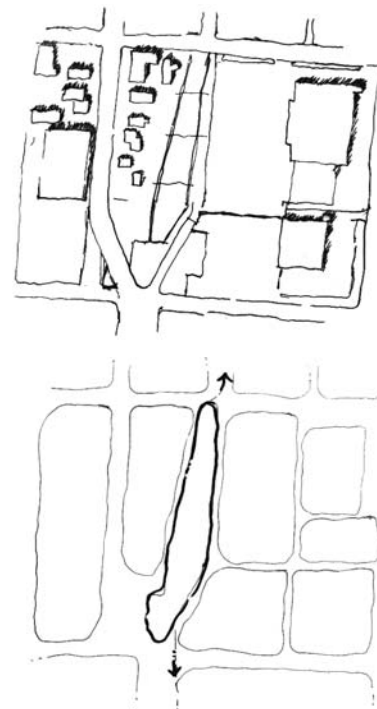
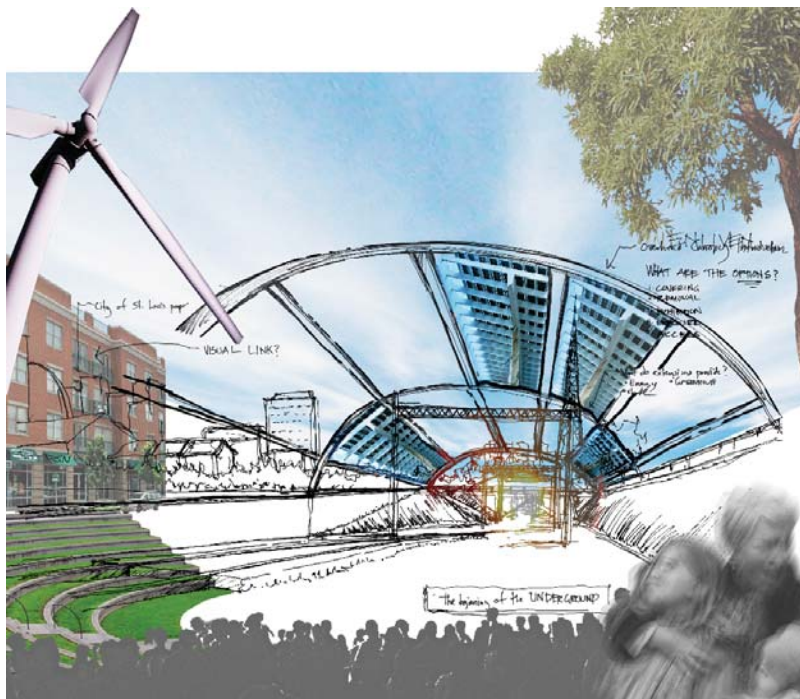
### s.r.a.m.e. applied: enliven

The existing parking lot and abandoned structure will parallel new interstate ramp development. Extending the subway system into the existing lot will invigorate a revitalized system. Creating transforming covers, focusing on physical and visual presence, and ensuring safety and security of the user will enable emergent growth and development to be successful.



f 3.54a location plan: concept of site nine. illustration created by designer 2008





f 3.54b conceptual design for site nine. sketch composited by designer 2009

## concept [site 10: underground subway-street extension]

In order to initiate development closest to downtown, physical and visual access will enable growth, change, adaptation, and transformation.

### **s.r.a.m.e. applied: access**

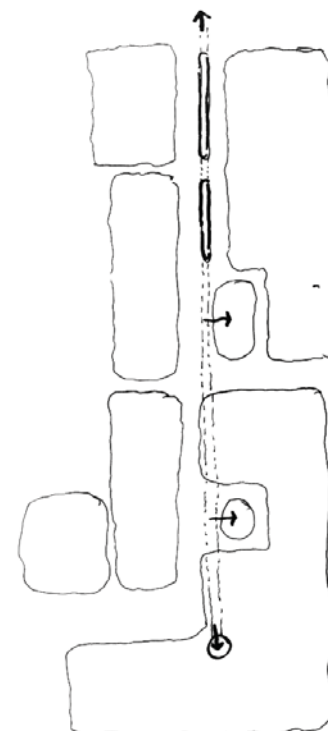
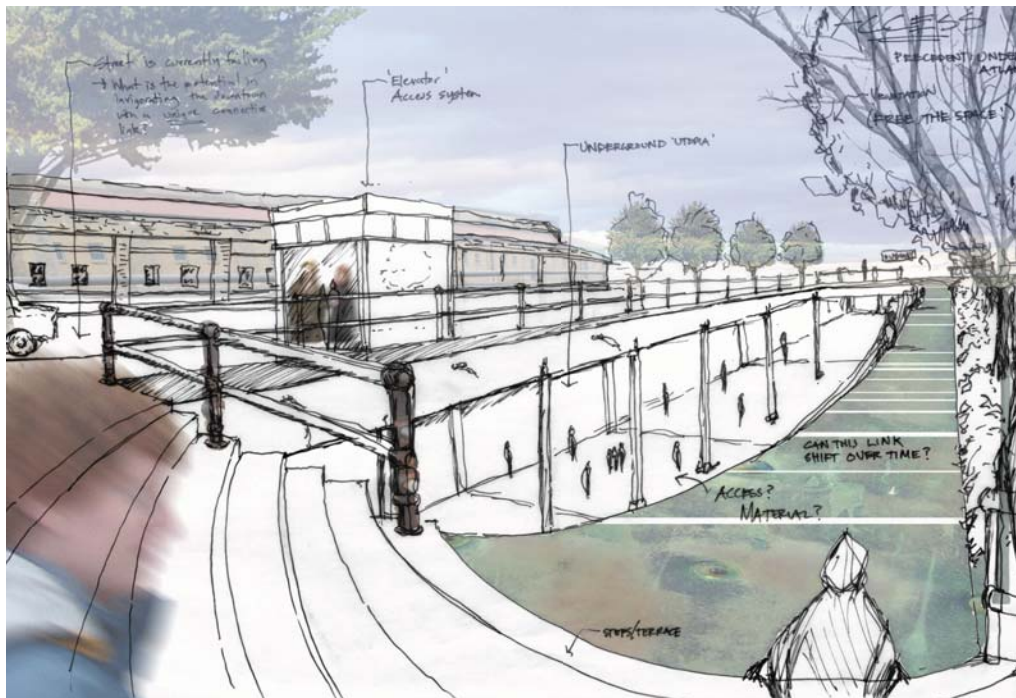
Submerging below the surface and creating a unique experience will initiate an accessible link. Empty parking lots adjacent to residential developments will connect and link temporary users and permanent residents.



f 3.55a location plan: concept of site ten. illustration created by designer 2008







f 3.55b conceptual design for site ten, sketch composed by designer 2009

## concept [conclusions]

Conceptual development is the realization of initial ideas, sketches, and desires into workable design solutions. Functional capabilities, aesthetic considerations, materials, connections - when linked together, an emergent system may succeed. The S.R.A.M.E. Strategy - beginning with sensory mechanism, responding, adapting and mutating due to use - involves immediate real-time reactions to external stimuli. Emergent systems will be successful if the initial four steps work in conjunction with each other.

Inventory delineated the site locations. Analysis led to a five-tiered system focused on enclosure, light, visibility, elevation, and quality of surroundings to understand functionality, pleasurability, safety and security, and potentials. Abstract ideas generate keywords, issues, opportunities, and constraints. Elements derived from programmatic strategies leads to the creation of an interconnected system.



## discover [conclusions]

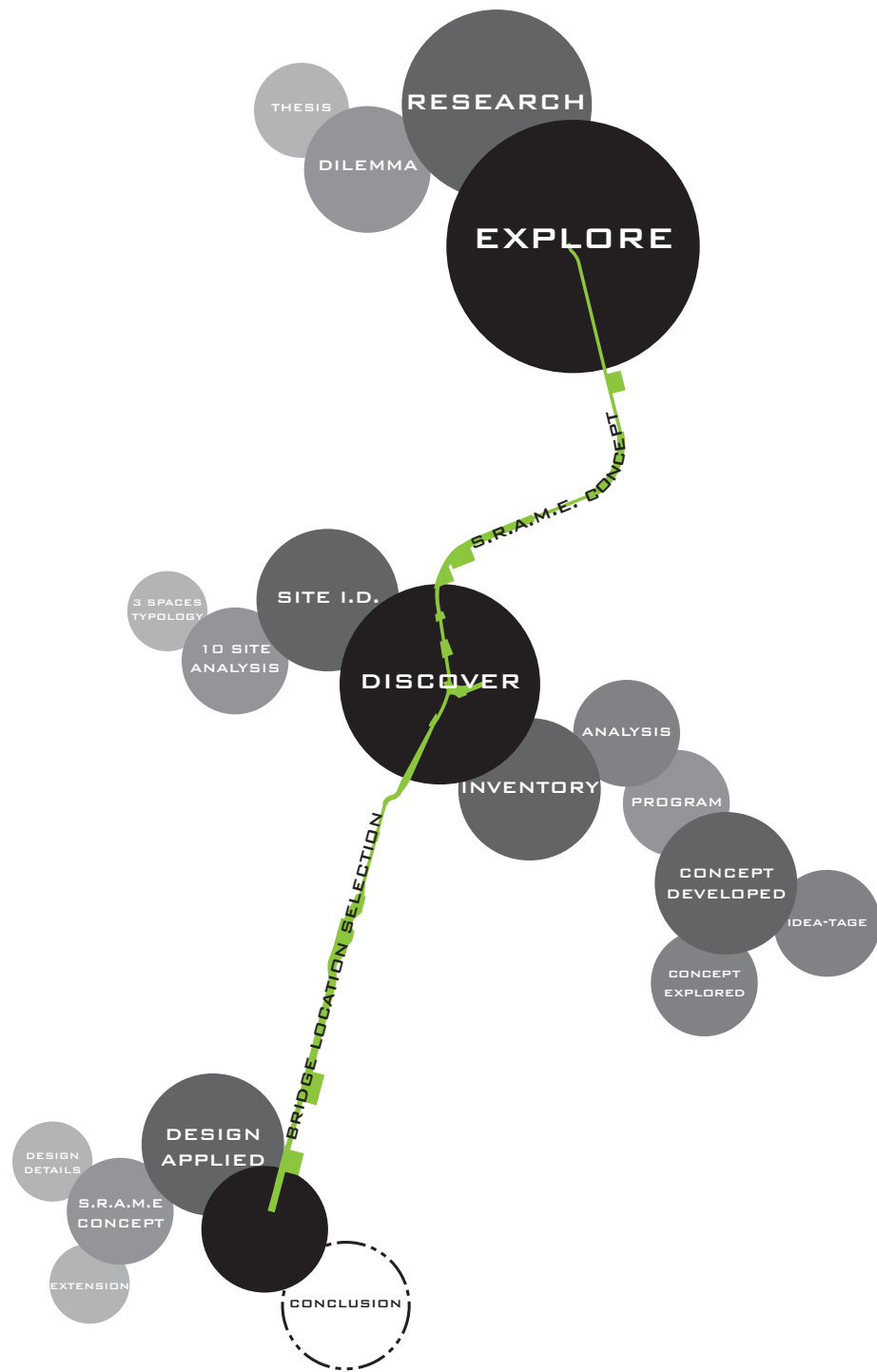
The five steps of the *discover* process (inventory, analysis, idea-tage, program, concept), coupled with the research surrounding the programmatic precedents and three contextual precedents (Promenade Plantee, High Line, Bloomingdale) enabled the formulation of the applied S.R.A.M.E. Strategy conceptual framework.

Each phase had to occur in a linear process, moving from site finding, observation, and information gathering to detailed assessment, analysis, and synthesis into workable design proposals. However, each phase alone would not suffice. The *discover* process was conducted in a cyclical feedback loop. Each phase fueled the other, creating connections, and establishing future design decision direction.

### **process philosophy**

The fundamental consideration in the process was the link between the established idea-tage visioning graphics and the connection to potential program and conceptual development. The abstract ideas did not necessarily indicate how or why a certain method was selected but provided guidance in where to move forward. Program tied the abstract ideas and conceptual designs into a cohesive solution. As the program continued to develop and direct directions as opposed to specific site elements, conceptual design too evolved.





## refer

Chapter 4 provides appendix maps and diagrams, a glossary of necessary terms with supporting graphic representation, a literature map enabling the design process, digital and physical references, and a synthesis report of the important precedent text (theoretical, site specific, contextual, and programmatic).

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# L I T E R A T U R E



**refer** [literature review and application]

## introduction

*The designer does not rely on the client-consultant relationship or the contractual agreement to begin work. In many cases a client may not even exist but will need to be searched out and custom-fit in order to match the designer's research discoveries. In this way the designer is the consummate spokesperson for the productive integration of waste landscape in the urban world (Berger 2006, 4).*

While specifically addressing neglected, abandoned, or 'wasted' opportunity sites as suggested by the incorporation of the term *dross* (waste) in a post-industrial, energy and resource hungry, increasingly privatized spreading communities, Alan Berger's initial maxims within *Drosscape: wasting land in urban America* serves as the basis for the undertaking of the following investigation and proposal. Emphasizing productive integration and reuse of waste landscapes, Berger acknowledges that there exists an accumulation of waste (termed as *dross*) over time due to deindustrialization, post-Fordism, and technological innovation. The resultant environment (termed as *scape*) creates the term *drosscape*. Adapting to the role of collaborator rather than dictator, seeking out the *dross* in order to remedy or alter situations, the interstitial waste growth is unsightly but still part of the 'landscape.' Thus designers must find these sites – these leftover wastes – and reintroduce them to better society.

Three **assertions** arise from this premise:

First, the continuation of a deindustrialized, automobile reliant, suburban sprawl inflicted, technologically advanced, digital society must be addressed, incorporated, managed, and integrated rather than ignored, blindly corrected, or developed.

Next, in order to not lose significance as a specialized profession, contemporary landscape architecture must evolve. Is it through the formulation of a discipline-less discipline or through the continuation of hybridized specialization?

Lastly, the rapid, dynamic conditions of the world must then be responded and approached through a design strategy that is also rapid, immersive, dynamic.

The three assertions are investigated through the following **claims**:

First, **intelligent buildings** – with their ability to simulate human reactions of responsiveness and adaptability – provide built evidence that static objects can collect, store, and synthesize changes, needs, and effects so as to create functional smart structures. What is meant by an intelligent building? What are the potential socio-economical-political-ecological benefits? What are the dynamic systems?

Second, these static objects – intelligent buildings – that respond to external stimuli by adapting to constant change and flux suggests that human actions can be simulated within dynamic situations, exhibits, and objects, or alternatively **interactive designs**, extending and evolving the role of human and computer interaction. How do people translate feelings, emotions, or responses? What occurs from person-to-person, person-to-machine, and machine-to-machine communication? How can interactive objects apply to the larger context?

Conclusively, interactive, responsive objects and designs coupled with smart, learning, intelligent buildings suggests that an emergent, adaptive, context-environment-people sensitive, and even emotional structure can be extended from a single item into a whole space. A structure without bounds, constantly changing, adapting and learning, dynamic, functional, usable, and useful; what is the hidden potential for this **intelligent environment** to shape, guide, change, and evolve?

### **claim 1: intelligent buildings**

*Intelligent buildings may be increasingly viewed as ones that provide a responsive, effective and supportive environment within which an organisation [sic] can meet its performance objectives. The technology, although still generally considered to be fundamental, is now seen as the enabler rather than as an end in itself (Croome 2004, xi).*

Derek Clements Croome's *Intelligent buildings: design, management, and operation*'s begins by discussing the current condition of cities as consumption increases and will continue to increase. An increase in sophisticated products emphasizing end-user benefit with a broad range of multi-disciplinary specialties will be required. Croome asserts that intelligent building functions must derive from those being served – the people. The architecture can then contribute to the well-being of the people, creating an efficient workforce.

Croome begins to attribute values to building and design properties, suggesting that architecture be shaped by “value for money, water conservation, occupant well-being, health, productivity, renewable energy, and energy effectiveness” (2004, 10), and even speculates that the “future drivers for intelligent buildings are likely to be information and communication technologies, robotics, smart materials, sustainable issues technology, and social change” (2004, 11). It would seem that for Croome, architecture takes on more than just the explicit physical development but also the implicit and hidden social factors.

Crucial to the application of specific built intelligent components are the series of diagrams within Mervi Himanen's essay in “The intelligence of intelligent buildings.” Himanen begins with a hierarchical pyramid depicting the growth of automated buildings with highly separate, single apparatus systems at the bottom of the pyramid, gradually progressing to much more integrated systems of building automation and integrated communication systems in the middle to finally, an anticipated intelligent organizational network that evolved from the bottom-up approach of design.

Himanen's funneling of human to building intelligence concepts has led to the development of the system for appropriate programmatic precedent studies determination. He provides examples of the implementation of intelligent building features and their connection to human intelligence, suggesting that interpersonal social, visual-spatial, linguistic, logical-mathematical, musical, bodily-kinaesthetic, and intrapersonal intuitive skills can be transferred into building operations. For example, digital user interfaces and sensing devices are similar to interpersonal social skills while automated building control and rest areas are reflective of intrapersonal intuitive human skills (Himanen 2004, 44).

Himanen also accepts the notions of usability offered by the interactive design community, as reflected in his assertion that “the intelligent building concept is a holistic combination of building solutions which satisfies the needs of the occupant and which adapts and grows in wisdom” (Himanen 2004, 39). Himanen's diagram states the supposed correct combination of digital machine operations and applications being paired with physiological, psychic, social, and mental modes.

Similarly, Himanen compares and contrasts how human sensory and cognitive factors have technological outputs, i.e. humans have interpersonal social skills while digital manipulations include a user sensitive interface or embedded sensors.

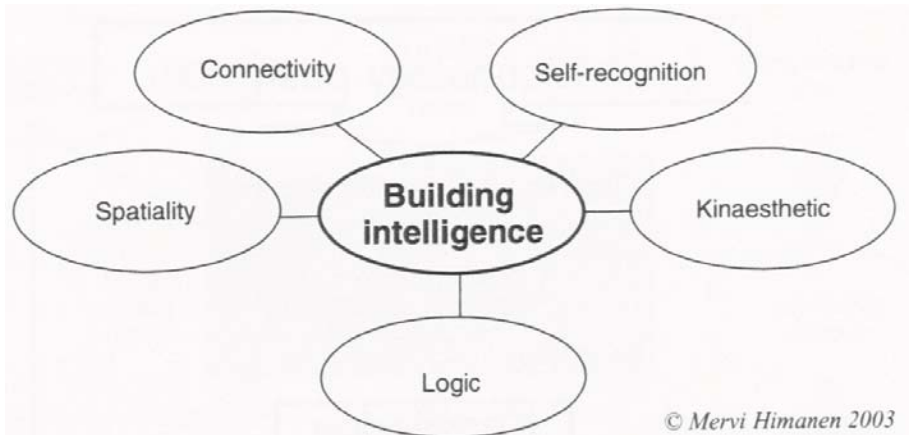
Himanen lastly translates expands the implementation of intelligent building concepts from human intelligence lent to buildings into a simple diagrammatic understanding of the specific qualities of building intelligence.



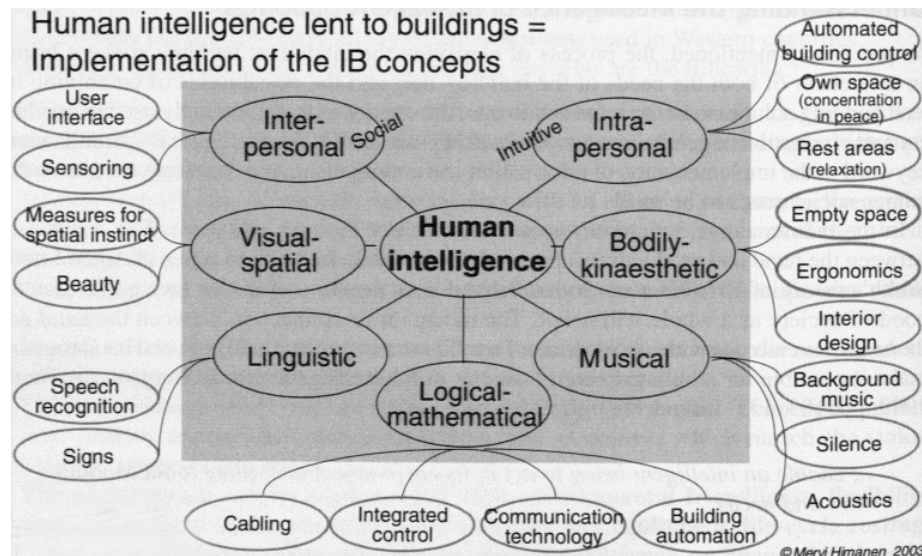
Proposing that there could be more added in the future, Himanen diagrams that spatiality or conscious understanding of spatial expression, connectivity or user recognition, self-recognition or a form of machine consciousness, kinaesthetic or the ability to sense changes and activity, and logic or embedded sensors that monitor and distribute data are the necessary components of building intelligence (Himanen 2004, 45). See f 4.1a, b.

Croome lastly summarizes the intent of an approach to a near-future, adaptive form of design, stating:

*[Air, sunlight, sound, and water] control may use traditional [or] new solutions, or a blend of these, but this does not remove or change the basic truth that the built environment is fundamental to mankind's sense of well-being (Croome 2004, 22).*



f 4.1a building intelligence translation into functional solutions. image source mervi himanen in croome 2004



f 4.1b human intelligence and relationship between man-to-machine. image source mervi himanen in croome 2004

## **claim 2: interaction design**

*If you are going to create good designs, you first have to understand people – what they need, want and enjoy, as well as how they think and behave...the practice of designing interactions is enabled by prototyping, that we arrive at good designs by prototyping early and often, by trying out ideas as quickly and frequently as possible, and by taking them to the users for responses and evaluations (Moggridge 2007, 725).*

In its most elemental form, Jennifer Preece, in *Interaction design: beyond human-computer interaction*, defines interaction design as “designing interactive products to support people in their everyday and working lives” (Preece 2002, 6). She continues by suggesting that interaction design is about creating, enhancing, and extending user experiences in relation to living, working, and communicating. To Preece, interaction design is as an interdisciplinary process that must focus on the creation of usable, appropriate, effective, and quality products.

Gillian Crampton Smith, director of the Interaction Design Institute Ivrea and recognized as one of the foremost academics in interaction design, defines interaction design, in Bill Moggridge's *Designing interactions* as “shaping our everyday life through digital artifacts – for work, for play, and for entertainment” (Moggridge 2007, xi). Moggridge furthers this definition, proposing that interaction designers focus on incorporating technology (in its most pedestrian sense) to fit “easily into people's everyday life, rather than forcing their lives to fit the dictates of technology” (Moggridge 2007, xi) because for Moggridge, “usability is only the first of the qualities we should expect from the systems we use; it should also be useful” (Moggridge 2007, xiii).

Key to all literature focusing on interaction design is the essentiality of an interdisciplinary team. Preece asserts that the concept has “always been acknowledged that for interaction design to succeed many disciplines need to be involved” (2002, 6), and is supported by Pirhonen, Isoamki, Roast, and Saariluoma in *Future interaction design* as well as Bagnara in *Theory and practice in interaction design*.

Each text notes that the complexity of contemporary products and practices with varying levels of understanding and intent has led to the ever increasing need to move towards an interdisciplinary approach. Pirhonen et al. and Bagnara approach interaction design with the intent not to form definitive notions of interaction design as a ‘discipline’; rather, each is an exploration, through various essays, of the theory, implementation, and production of various products, spaces, and environments.

The design then of products is not solely focused on the functional or aesthetic qualities but also of how humans interact with the object and how the object interacts back.

### claim 3: intelligent environments

*Electronic commerce is not, as it turns out, the replacement of bricks and mortar by servers and telecommunications, but the sophisticated integration of digital networks with physical supply chains. Increasingly, we are living our lives at the point where electronic information flows, mobile bodies, and physical places intersect in useful and engaging ways. These points are becoming the occasions for a characteristic new architecture of the twenty-first century (Mitchell 2003, 3-4).*

Lucy Bullivant expresses her concern in *4dsocial: interactive design environments* that only one definitive text and several research based studies exist to provide information on the emerging impact and role of intelligent environments. Malcolm McCullough's 2004 *Digital ground: architecture, pervasive computing, and environmental knowing* serves as the quintessential reference for current theory and practical approaches towards human-to-computer relations, relationship to design, implementation strategies, and precautions or limitations.

McCullough begins by stating that the shift into interactive design, intelligent architecture, and pervasive computing "represents a paradigm shift from building virtual worlds toward embedding information technology into the ambient social complexities of the physical world" (2004, ix). He suggests that technology is "not about predictable outcomes so much as richer experience. It pursues much more human-centered goals in natural interaction" (2004, 72). It is about understanding how computers can provide a digital framework or enable what could be viewed as personal network or even a living organism.

McCullough realizes the need to create or have unique experiences be created by the person. "Few of us want our experience designed for us; yet just about every one of our experiences that is mediate by technology could be better designed. It is to address the paradox of programmability that the new discipline of interaction design has emerged" (2004, 17). Immediately, McCullough makes the case for a need not for immediate intelligent structures, but responsive, much better created spaces.

He takes care to note that "design, technology, and academic inquiry cannot afford to continue to ignore human emotional and intentional states (rather than merely human behavior) simply for the sake of certainty" (2004, 44). While it is easier to simply create responsive environments, as noted above, they are little more than action/reaction features. This is not learning or adapting; just a programmed monkey reciting rehearsed regurgitation.

What is the implication for architecture and the design profession? If interaction designers focus on people – their motives, operation, cognitive abilities –and how these observations can be translated "to become an ambient and social medium, interaction design brings this work more closely into alignment with the concerns of architecture...information technology has become ambient social infrastructure. This allies it with architecture. No longer just made of objects, computing now consists of situations" (2004, 19, 21).

"The disciplines of architecture and interaction design both address how contexts shape action...their benefits are to be found in the quiet periphery, and not in the seductive objects of attention" (2004, 47). What is the periphery? McCullough suggests that any insertion must not interfere with lives but instead, enhance, where "form must provide the periphery and the ground for our swapping of bits, our multiplexing of activities, and our continued need for an enduring environment" (2004, 62). Thus technology is the enabler and not the final end product, a vital component but not the desired end product, a viewpoint that has evolved since the days of artificial intelligence, virtual reality, and the fear of conscious machine presence ala Winston Smith and Big Brother in 1984.

McCullough does seem unwarranted in his claim that architecture has not focused on the person, suggesting that the discipline ignores function in favor of form (2004, 63). Designers are concerned with the end user; if for fun and games, the entertainment industry can focus on interaction. Yet, for community design, or urban design situations, what are the implications? He suggests that:

*What is at issue is participation. The pushbutton industrial machinery of 1939 and the virtual realities of 1989 both left the human subject just sitting. Well-being requires a better state of human activity. Much of the human sense of environment emerges from our activity in habitual contexts. All this becomes the subject matter of design (2004, 21).*

How can people begin to benefit from this intelligence? McCullough tracks the process of potential human acceptance of such a precarious situation due to the safety and security issues posed, suggesting that failure occurs if there is friction between the object and person; “if, on the other hand, the people are made safer, more comfortable, more eager to purchase, more efficient, or just plain happier, then the design has succeeded” (2004, 19). However, he notes that “some scenarios of pervasive computing have fallen far short of this trust, as expressed in the common fear that devices are watching and talking to each other about us” (2004, 118).

McCullough does acknowledge the multi-disciplinary approach that is reflected in previously cited interaction design literature. It is not just designers but psychologists, architects, ethnographers, product designers, entertainers, management consultants, and policy makers working in sync. The vital component then is not just the creation of the technology, but also the most appropriate, non-interfering, indistinguishable form; “the most profound technologies are those that disappear...they weave themselves into the fabric of everyday life until they are undistinguishable from it” (Mark Weiser in McCullough 2004, 67).

It is a drawback that embedded technology remains a gash; “we have been very good at putting computers into the environment, but we have been very bad at getting them out of the way” (2004, 70). McCullough suggests then that intelligence is not about a utopian, robot dominated society, but instead “the intentionality must lie in human organizations, abilities, and practices” (2004, 72).

The underlying question then becomes – how can we make these interactions meaningful?

*If the tuning of smart environments were to rely exclusively on ad hoc inventiveness, work would proceed slowly. If it were to reduce its considerations to functions that could be modeled more predictably, this effort would produce sterile results. In between these approaches, something is needed in the way of continuous, if not fully formalized knowledge... That aspect is type. Persistent structures of form and environment should be able to accomplish half the work of tuning aggregations of portable and embedded technology... location and type have to matter. Otherwise, with everything possible all the time, mostly chaos will occur (2004, 94).*

‘Digital ground’ then is suggested as “interaction design that must serve the basic human need for getting into place” (2004, 172). Architects and designers are thus not concerned with the creation of a place (place being a singular idea, easily traceable, visible) for anyone can place mud, brick, mortar, and stone to form a structure. Instead, it is the creation of a sense of place that is the ultimate goal. McCullough questions the possibility of this occurring at the human scale for the “ultimate source of value is whatever people delight in doing ...it does not have to consist of fulfilling the same need to ever highly induced levels” (2004, 207), and reasserts that intelligent design could be the fulfilling of simple needs, discovering value in the unattainable, or serving as an active participant in daily change.



McCullough suggests a ten step process to approach implementation:

1. Sites and devices are embedded with microprocessors as intermittent and local systems can send and receive ongoing instructions to and from their surroundings.
2. Sensors detect action, remain unobtrusive as “adaptable programmability is the key to the relationship between sensors and embedded microprocessors” (McCullough 2004, 75).
3. Communication links form ad hoc networks of devices.
4. Tags identify actors.
5. Actuators close the loop, for as McCullough notes “We want environmental systems to keep out of the way, but we also want them to do something” (2004, 83), a continuing ironic human trend.
6. Controls make it participatory; “Know how to empower, not overwhelm” (McCullough 2004, 85).
7. Display spreads out.
8. Fixed locations track mobile positions.
9. Software models situations.
10. Tuning overcomes rigidity.

Conclusively, McCullough determines the implications of this resilient, responsive, interactive design:

*In our age of technological saturation, response to place becomes the most practical adaptation strategy of all (2004, 213).*

McCullough's contribution is supplemented by William Mitchell's *Me++: the cyborg self and the networked city*. Stating that “invisible, intangible, electromagnetically encoded information establishes new types of relationships among physical events occurring in physical places” (Mitchell 2003, 4), Mitchell proposes that digital environments are already creating a new type of world, previously “a world structured by boundaries and enclosures to a world increasingly dominated at every scale by connections, networks, and flows. This is a world of less rigid, more fluid and flexible relationships” (Mitchell 2003, 5).

Networks and information technology control all. “Connectivity had become the defining characteristic of our twenty-first-century urban condition” (Mitchell 2003, 11). Work and home no longer require separation, or perhaps, cannot be separated; “the constants in my world are no longer provided by a contiguous home turf: increasingly, my sense of continuity and belonging derives from being electronically networked to the widely scattered people and places I care about” (Mitchell 2003, 17). “My biological body meshes with the city; the city itself has become not only the domain of my networked cognitive system, but also the spatial and material embodiment of that system” (Mitchell 2003, 19). Perhaps this is the city with a brain, the thinking and learning city? Is it one “enabled by electronic devices that can immediately begin to communicate wirelessly with one another when they are brought into proximity and that can work together to support whatever activities are taking place” (Mitchell 2003, 164)? If so, then, providing suggestions and latent potentialities, Mitchell – similar to McCullough – does not propose the final solution but rather, current observations that enhance the impact of future intelligent environments.

## application

What then is the potential impact of intelligent environments on the design professions? Are they truly a 'new' form of design? Or is it but an offshoot of current practices?

First a working definition of technology must be understood, for it seems that this component – the digital venture, the computer, the inorganic thinker – is absolutely essential for the success of an intelligent environment.

Yet, is that all that technology provides?

McCullough questions what is termed by 'technology' and why people are afraid of the implications. Is it Orwellian Big Brother mentality, or is it about newness? "At the usual level of understanding, all technology is unnatural. One of the most common definitions of natural is the absence of artifice" (McCullough 2004, 212) yet "understood as our own species' means of adaptation, technology is natural too. In this sense, our homes and highways and management information systems are as natural as the nest a bird builds. They are forms of adaptation within a living ecosystem" (2004, 212). Thus, McCullough's assertions claim that even without the requisite 'technological' innovations of microprocessor, sensor, or microchip, nature emulates the concepts of interaction that are trying to be embodied within intelligent structures.

The most poignant examples are in two seemingly dissimilar projects: the Blur building (what could be termed 'architectural' with its use of structure and form) and Fresh Kills (what most would consider landscape).

The Blur building, with its reliance on technology (smart weather system) to act as natural and the natural (water) to be the form of technology, takes concepts of intelligence into a relatively built structure. Fresh Kills programs with open indeterminacy, allowing for the evolution of surfaces to emerge over time. What may seem opposing ideas is actually quite relevant in dynamic contemporary practices; if spaces are planned to evolve by indeterminate means, then the chance for evolution and change remains. A new form or use may emerge. McCullough, lastly, asserts that "human artifice copies the resilience and wastelessness of nature. The addition of distributed sensing, local memory, abstract pattern recognition, and feedback control systems advances this imitation" (McCullough 2004, 213). So, conclusively, if design seeks to imitate nature and yet humans and the constructed realm are nature as well, and design is about the attempt to implement ourselves (which is nature) into structure and form, then does that not logically suggest that all design – whether structural, formal, open, planned, or chaotic evolution – is what is natural.

Ashley Schafer, Reeser, and Gilmartin, in "Technological landscapes," *Praxis*, volume 4, notes that Diller Scofidio, as exemplified in the Blur building, "avoids the modernist correlation of form with hardware (technology as product) and the postmodernist correlation of form with software (technology as process)...they indicate an appropriate of technologies not for products and results, but for active, open-ended behaviors and functions" (Schafer, Reeser, and Gilmartin 2002, 97). Technology then is not a toy, a simple object, a mere thing; rather, "technologies are not design or fabrication tools, but instead are materials to be deployed...afford a means to an end...to inform design, to realize intention, and to create effects" (Schafer, Reeser, and Gilmartin 2002, 97).

Reiterated again, technology does not take form or require a certain aesthetic quality. It can, in essence, be any new creation. It seems remarkable that every single object was at one point considered 'technology,' even that which was there before – the land. "Nature may be more uncontrollable than landscape. Landscape design is all about control...landscape architecture and technology are not far away from one another. Landscape is in fact a technology" (Schafer, Reeser, and Gilmarin 2002, 101).

Herausgegeben Von Regina Sonnabend's *Serve city* provides a further example of a futuristic vision of the changing city. Taking the context of knowledge workers within Sydney, Australia, Von Regina Sonnabend proposes an architecture of the people. She maps daily lives to understand patterns, changes, similarities, confluences. The results affect the construction and location of prototypes, functions, and uses. The 'city' is interspersed with interventions that allow for addition or subtraction; in a state of flux, *Serve City* is not a final state, but rather, a constant evolution:

*It would appear that the only sure statement we can make about future living and working conditions is that it is impossible to make an exact forecast of what they will really be like. This doesn't mean that we cannot cater for such conditions or that we should simply continue using traditional approaches to planning (Von Regina Sonnabend 2003, 67)*

*The Media House Project* furthers the conceptual framework of reactive and adaptive environments, embedded sensors, and detecting systems within not just a building but into the daily lives of students from the Universitat Politècnica de Catalunya, the Elisava design school, and the Media Lab of the Massachusetts Institute of Technology. Their research uses computers to build within a structure so that the inorganic can develop (learn) alongside the organic (humans) and thus grow (in intelligence) with physical form.

Questions are raised – one can create as a society with these methods, but at what cost? How are social impacts evaluated? What are the social effects as compared with conventional inanimate architecture? Is it worth the more productive, sustainable, social, meaningful spaces for the flexible, adaptively, and learning object?

These projects, with their growing interest in artificial intelligence and inanimate 'feelings,' suggest the possibilities of a 1984-esque, Orwellian introduction of a technology driven society. Yet, even with the multitude of projects examined, Bullivant manages to focus on issues of security and concern, providing that:

in an era of pervasive computing we need to think further about how humans, devices, and their shared environments might coexist in a mutually constructive environment...It is vital to distinguish between 'interactive', 'reactive' and 'responsive', and to understand the evolution of theories of interaction and the interdisciplinary subject of cybernetics, the study of control and communications in goal-drive systems in animals and machines (Bullivant 2007, 11).

## conclusion

*One plans not spaces, spaces, or things; one plans experiences...the best community, by this test, is that which provides for its habitants the best experience of living ... The true design approach stems from the realization that a plan has meaning only to people for whom it is planned and only to the degree to which it brings facility, accommodation, and delight to their sense. It is a creation of optimum relationships resulting in a total experience (Simonds 1997, 399-390).*

John Ormsbee Simonds seminal text, *Landscape architecture*, conclusively asserts the role of the landscape architect i.e. the designer. No matter the method, the tool, the system – design is about the creation of not just a place, but the sense of place. Simonds' final reflection is mirrored in the grounded observations of Francis D.K. Ching's architectural primer, *Architecture: form, space, and order*, noting that “through the volume of space, we move, see forms, hear sounds, feel breezes, smell the fragrance...as space begins to be captured, enclosed, molded, and organized by the elements of mass, architecture comes into being” (1996, 92).

Two ‘specialized areas’ of architecture and landscape architecture – yet similar patterns of thought:

*Still shape, arrange, and connect spaces...still care about the qualities of visual and ambient environments...still seek commodity firmness and delight...Commodity will be as much a matter of software functions and interface design as it is of floor plans and construction materials. Firmness will entail not only the physical integrity of structural systems, but also the logical integrity of computer systems. And delight? Delight will have unimagined new dimensions (Mitchell 1999, 104-105).*





**refer** [landscape architecture literature review]

## contemporary landscape architecture

*Urban planning has proven to be incapable of adapting itself to the speed of these changes. It is impossible to imagine integrated and total development models. One must concentrate on parts of the city, pinpoint areas requiring intervention which can create relations and complex reactions, and then connect them into a single inhabited landscape* (Baglivo 2003, 34).

Stephano Baglivo's *Digital odyssey* explores mutability, transformation, and change in terms of architectural to landscape distinctions. Brian McGrath and Graham Shane, in *Architectural design journal's* "Sensing the 21st century city: close-up and remote," states that the "21st-century global city, defined by the duality of mass urban migrations and continued exurban sprawl, provides innumerable challenges and opportunities for today's architects" (2005, 5).

What is the relevance of contemporary landscape architecture? What is its place? Perhaps this can best be explored by examining the three assertions that framed the claims for an intelligent environment.

### issues

First as the conditions of the city must be addressed, a deindustrialized, automobile reliant, suburban sprawl inflicted, technologically advanced, digital society cannot be ignored. "What is still perceived as the radial spread of the built fabric of the city into the countryside is more correctly understood as rhizomatic" (Weller and Musiatowicz 2004, 69). In whatever their manifestation, cities are operative.

Or are they more? "Infrastructural landscapes are positively charged, activated landscapes that seek to change...they establish multiplicitous relationships...these changes are not only physical but, just as importantly, conceptual...one landscape can change a city" (Poole 2004, 43).

It is especially interesting to note that even in the 1960s, this issue had already become evident, notably by Kevin Lynch within his *Image of the City*:

*Moving elements in a city, and in particular the people and their activities, are as important as the stationary physical parts. We are not simply observers of this spectacle, but are ourselves a part of it...most often, our perception of the city is not sustained, but rather partial, fragmentary, mixed with other concerns. Nearly every sense is in operation and the image is the composite* (Lynch 1960, 2).

Lynch realized the dynamic composition of the city and its effect on shaping space. Yet he does not suggest a plan, an order, or a structure; rather, he proposes that "an environment which is ordered in precise and final detail may inhibit new patterns of activity...it indicates that what we seek is not a final but an open-ended order, capable of continuous further development" (Lynch 1960, 6).

Mitchell noted this appropriation of finality, of fixity, of the 'master plan' as absolute was considered to be the most appropriate accommodation of design:

*The key instrument of the traditional spatial organization strategy was the written architectural program...architecture of the twenty-first century can (if we choose to take the opportunity) be far less about responding to such rigid programs and much more about creating flexible, diverse, humane habitats for electronically supported nomadic occupation* (Mitchell 2003, 162).

Two similar thought patterns yet different professions operating at different time frames, suggestive of the power inherent within design encompassing not just a product but a process, an evolving changing dynamic pattern. “It is difficult to see this period as anything other than the next stage of technical modernity, the celebration of technology” (Raxworthy and Blood 2004, 10), but again, if technology can be found in any aspect, what does this imply for designers?

### **landscape urbanism**

Perhaps this is where the theoretical emphasis placed by landscape urbanism is best suited to illustrate the evolution of contemporary landscape architecture. There are many varied definitions, but “very simplistically, landscape urbanism is a strategic approach to the formation of an urban scheme through the transformation of processes related to landscape” (Gray 2007, 94).

If we take then that landscape is a form of technology and that technology is ubiquitous, surrounding, and the primary element that will be part of contemporary design, then it seems absolutely essential that these issues be addressed in any future proposal. Sure, there are several other working definitions, including the “integration of natural processes and urban development into the unfolding of an artificial ecology...landscape urbanism is holistic and therefore interdisciplinary” (Weller 66, 2007).

Some would suggest that landscape urbanism is a synthetic and multi-scalar discipline leading a range of other disciplines and interests; as offered by Hight, landscape urbanism “suggests neither a new formalism nor a renewed emphasis on landscape in the city. It is not a theory of design but promises to innovate at the level of design practice” (2003, 22).

Landscape urbanism is about questioning. What is landscape architecture? What is architecture? Is it not all design? Should it be all or how can other disciplines influence landscape architects?

*“Landscape urbanism blends market –based real estate, community activism, environmental issues, and political issues that planners must develop; reduces the blurring of nature-culture; dismantles hierarchy, boundary, center; focus on indeterminacy, open-endedness, intermixing and cross-disciplinarity” (Corner 59, 2003).*

Landscape urbanism is about change. It is about dynamic, organic, ecological processes that are deeply embedded in human faculty:

*We could abandon the idea of architecture as a discipline of imaging a final and immutable state or image, turning ourselves into agents who design processes for emerging material systems and manage these over course of time...empower us to integrate the unpredictable, not as something against which we have to protect ourselves, but as a material we work with (Moreno and Grinda 2006, 162).*

Landscape urbanism is about understanding the impact of decentralization following World War II and subsequent creation of suburbia; the ineffectual approach of architects, urban designers, and planners have had on city planning and design; and the potential irrelevance of the landscape architecture profession and the need to redefine its relationship to its discipline as suggested by Moreno and Grind’s proposal:

We might wonder then, if the categories ‘city’, ‘landscape’ or infrastructure belonging to other eras, can be combined in a new category: something that would contain the germ of landscape in its extension and its materials...materialized by way of the techniques developed for the creation of artificial environments and the raw efficiency of infrastructures...could give new



meaning to the discipline that engages with urban phenomena...that could reposition it outside of the normative morass of western urbanism...We might ask ourselves what would happen if we were to introduce, into our artificial landscape, a whole series of succession and natural growth laws in conjunction with geometries and rules to generate artificial environments. Welcome to an infrastructural city of natural qualities, artificial material landscapes, evolved and cultivated as if they were living organism that have assumed the role of what was called architecture (Moreno and Grind 2006, 164).

Without a working a definition, open-ended, left to evolve – it seems landscape urbanism, in theory, holds the principles that can enable an adaptive proposal (such as an *intelligent environment*) to come to fruition. Richard Weller suggests six landscape urbanism claims.

First, the theory understands the city as a hybrid ecology where nature is a complex self-organising [sic] system. Urban life results from temporal aspects, with culture and nature an imbalanced instead of equilibrium-based system. Design encompasses all not distinguishing between professions, specialities, techniques. Digital experimentation is seen as a method to map complex social and ecological forces. Functionality and rational design will result when designer subjectivity and authorship is released. Lastly, it is upon the horizontal surface of landscape that this urbanism is best suited to occur (Weller 2007, 67).

Thus, landscape urbanism seems to suggest nine oppositions to contemporary planning and design. First, landscape urbanism does not seek to distinguish between the Garden and the City, the contradiction inherent within the terms 'landscape' and 'urbanism', or the perception that successful landscapes stem from balance and equilibrium. Next, fixity and finality are an ongoing process, subjective designs focused on form are rejected in favor of locating the more rational, and a middle-ground (or perhaps an altogether new concept) exists between two contrasting design approaches of neo-conservative new urbanism and post-modern avant-garde originality. Lastly, non-contextual designs without relation to people and place, the control modern planning supposes over design, and McHargian binary coding where objective mapping leads to the best possible use of space are rejected concepts by landscape urbanist theorists and practitioners (Weller 2007, 67).

### **critique and application**

Yet it is interesting to note that few projects actual do what they say they do. Landscape urbanism, throughout its mystique and application of the indeterminate, the unknown, the changing – in the end, its representation still is about the final product. "The contradictions between the desire to draw out the unseen and the unknown and the subsequent pragmatic designs is strong, although it should be noted that the actual number of designs which can be compared to the original landscape urbanist intentions is limited" (Gray 2007, 100).

Weller also notes:

*Although landscape urbanism is fashionable amongst a certain cognoscenti, if you cross over to the planning and urban design areas...regarding the sprawl versus smart growth debates, landscape urbanism is never mentioned. It is new urbanists, planners and developers, not landscape urbanists, who are shaping the world...soon it [landscape urbanism] will have to define itself in relation to other disciplines...and avoid doing what landscape architecture has done before: claim the rights to everything but do actually very little (Weller 2007, 71).*

While landscape architecture is seeking to redefine or to properly define its contemporary role, landscape urbanism is finding little ground as a successful contributor to shaping successful places. What then is its relevance. Gray lastly asserts then that:

Perhaps the power and influence of landscape urbanism comes not as practice or discipline, but as a way of thinking that highlights issues of territory, process and natural systems that might otherwise be forgotten by the traditional practices of city planning and urban design... perhaps now is the time to let the theoretical field lie fallow... the projects that emerge may display none of the qualities that landscape urbanism might hope to nurture, or they may just translate the various strands of their diverse genetic code into strong and clear manifestations of landscape urbanism (Gray 2007, 100).

### **a call to action**

If this push to consider the evolution of a discipline is to be fulfilled, then the second assertion – that in order to not lose significance as a specialized profession, contemporary landscape architecture must change (whether through the formulation of a discipline-less discipline, a truly multi-disciplinary approach, or through the continuation of hybridized specialization) – must next be addressed.

*The discipline of landscape architecture needs to reassess its understanding of ecology and shift the discourse from environmental protection and management to one of constructed ecologies where current ecological conditions are examined through an understanding of the social and historical processes of urbanization (Miller, Martin, and Kerr 2007, i).*

This seems to suggest that landscape architects have made or are making little contribution to the world. Perhaps an overly cynical view, but perhaps warranted. What is it that makes landscape architecture unique? Is it a return to values – or a definition of what exactly provides value to landscape architects today? For “a failure to do so may mean that the role of the landscape architect remains fixed, working in the traditions of the gardenesque, reinforcing the figure/ground oppositions of human urbanisation (sic), being exterior to environmental ecosystems” (Miller, Martin and Kerr 2007 i).

Gordon Cullen proposes that:

*Firstly, we have to rid ourselves of the thought that the excitement and drama that we seek can be born automatically out of the scientific research and solutions arrived at by the technical man... this means that we can get no further help from the scientific attitude and that we must therefore turn to other values and other standards (Cullen 1977, 8).*

If, as Corner suggests, “landscape architecture... as a discipline, has become increasingly estranged from a sense of traditional and poetic value” (Corner 1991, 115), and, as provided by Cullen, that an overly rational, functional modernist, prescribed pattern may have dissuaded designers from considering the potentiality in the immeasurable – the emotions, feelings, and instinctive responses – then the final assertion that rapidly changing dynamic conditions of the world must then be responded and approached through a design strategy that is also rapid and dynamic, an strategy or framework that is responsive, immersive, dynamic, and adaptive.

“Hermeneutics provides the basis for a landscape architectural theory that transcends pictorial image and historical style by critically engaging contemporary circumstance and tradition” (Corner 1991, 115). For a “hermeneutical landscape architecture is therefore something that is based on situated experienced, placed both within space and time as well as in tradition, and is equally about resurgence or renewal as it is about invention” (Corner 1991, 129). It is about creativity, exploration, development – but not finality, product over process.

How inspiring is it to metaphorically understand landscape (or an environment) as “the most basic form of infrastructure...the set for the play that is existence” (Raxworthy and Blood 2004, 13)? Would it not seem wondrous to let the unknown occur, and not just to say it (as landscape urbanists tend to) but also to do? “This is something that you can’t predict and you can’t design, but you should allow for these accidents to happen” (Miller, Martin, and Kerr 5, 2007).

### **application for intelligent environments**

How can this system be created, this intelligent environment, one capable of transcending disciplines and boundaries, redefining and allowing, enabling and sharing – while still providing what is necessary, essential?

This part is much more complex, for “it becomes evident that we need to look beyond logic and the symbol processing paradigm to understand how the mind works and how the landscape/cityscape generates meaning” (Boyer 2003, 30). Lynch may suggest that an order provided will dictate the necessary reactions; it was McHarg’s belief that layer upon layer will successfully show designers what must be done. Has this ever come to fruition? When has a plan been dictated by scientific means to reach a predetermined end – has it not always been the structure of change, of unknowns, of variables that has created places?

Conventional models of thinking “assume that cognitive information flows in a linear and sequential manner...new knowledge is stored according to the arrangements determined by a program stored in memory” (Boyer 2003, 19), but it is much more helpful to understand how places are read as a complex arrangement, where “information flows synchronically and diachronically across a series of connections in the network. Cognitive processes are assumed to be distributed and parallel, not linear and causal” (Boyer 2003, 20).

Perhaps then we have arrived at the assertion of not only the uniqueness but also the essentiality of intelligent environments. As Diller states, “I also don’t think technology is absolutely about control. There are certain technologies that are conceived actually to submit control. They control up to a certain point, and then the system itself takes over” (Schafer, Reeser, and Gilmartin 2002, 101, 104). Perhaps designers can make decisions – and then sometimes, allow for those decisions to change themselves. Even Lynch notes that people – the ones who spaces and places are created for – can make decisions as opposed to just the designer: “If the environment is visibly organized and sharply identified, then the citizen can inform it with his own meanings and connections. Then it will become a true place, remarkable and unmistakable” (Lynch 1960, 92).

If decision-makers – us designers – could find a general equation which would tell what is beautiful or what shape of building is correct for an office block, then certainly there is no further need for designers; but that is not true. Why do we continue to explore today what is meant by design, how it enriches, enlivens, creates, shapes? Even if the end is unknown:

Absences, deficiencies and deformations carry a structuring potential. Allowing within themselves diversity, conflict, and change...organisational [sic] structures emerging in this way can be likened to ecological structures...they are scale-less and subject to contortions and manipulations that reduce the heroic architectural object to a mere crinkle in the urban surface (Weller and Musiatowicz 2004, 69).

## **conclusion**

So let us then strive not dictate, to demand, or encroach. Let us try to accommodate, understand, read into, analyze, and decipher. Let us leave the natural up to forces uncontrollable. Let us learn to adapt, to grow, develop, evolve, for design cannot be sustained upon predeterminancy, control, or power. Rather, it is a compromise between that which we as humans can do – and that which does to us:

*To make a sand pile on the beach, you can form a mound of sand with a bucket and a shovel, then the mound will disappear with the wind over time. The alternative is to place a large stick in the ground where the wind will instantly form a pile, reshaping the pile every time the wind changes its direction (Gerwen 2004, 233).*





## **literature** [glossary of terms]

## **intelligent**

Building intelligent agents means building rational ones...in definition is the one that has given strength to the line of thought that advocates that intelligence is an emergent property of some embodied complex systems (Media House Project, 43).

## **environment / landscape**

Hermeunetics: A hermeneutical landscape architecture is therefore something that is based on situated experienced, placed both within space and time as well as in tradition, and is equally about resurgence or renewal as it is about invention (Corner 1991, 129).

## **city and nature theory**

Everything is connected to everything else...we fail to realize the full codependency and interactivity of things (Corner 2003, 62).

First we need to cease our insistence of a duality in nature: dominating and pillaging its resources while at the same time making it the repository of an idyllic redemptive capacity to cure all the ills of civilization; mercilessly exploiting it while letting ourselves be apathetically fascinated by its beauty (Moreno and Grinda 2006, 161).

## **technology**

Typically understood as recent developments.

To work explicitly with technology is to concentrate on those artefacts [sic] that are not yet available to all (Bullivant 2007, 31).

Technology then is not electronic, digital, or revolutionary. At one point, any new development was considered technological advancement. Sensory media, computerized interaction, an emergent landscape, an urban farm, a residential neighborhood. Why must there exist a divide? Can technology not be any applied surface, material, extension, or development?

### **intelligent buildings**

An intelligent building is one in which the building fabric, space, services, and information systems can respond in an efficient manner to the initial and changing demands of the owner, the occupier, and the environment (Croome 2004, 6).

Dynamic and responsive architecture; provides a responsive, effective and supportive intelligent environment (Croome 2004, 6).

An intelligent building is more than just the technologies it uses. The building shell must be adaptable to cope with change over time (Croome 2004, 9).

Intelligent Buildings Institute suggests that intelligent buildings are “productive and cost effective environments through the optimization of its four basic elements – structure, systems, services, and management – and the interrelationship between them” (Croome 2004, 6).

### **interaction design**

Interaction design is a practice...a collective effort to translate the wealth of tools already available for designing the physical world to enrich the design of the digital world (Bullivant 2007, xxiii).

Process of mutual or reciprocal influence among the variables or parts of a system. Interactions are a succession of actions, each responding to prior actions and each being responded to by succeeding actions. By identifying and studying interaction patterns in this succession, we can design interventions that provide material support for desirable interaction patterns to emerge. The essential concept of interaction is reciprocal action, influence or effect (Poggenpohl 2006, 288).

### **intelligent city**

Virtual reconstructions of cities; digital city, information city, wired city, telecity, knowledge-based city, electronic communities, electronic community spaces, flexicity, teletopia.

Environments with embedded information and communication technologies creating interactive spaces that bring computation into the physical world; physical environments in which information and communication technologies and sensor systems disappear as they become literally embedded into physical objects and the surroundings in which we live, travel, work.

Territories that bring innovation systems and intelligent city technologies within the same locality, combining the creativity of talented individuals that make up the population of the city, institutions that enhance learning and innovation, and virtual innovation spaces facilitating innovation and knowledge management.

### **interactive architecture**

Architecture of social relations and effects (Bullivant 2007, 11).

Affecting not just actual output (in response to input) but also about affecting the way that output is calculated (Bullivant 2007, 26).



### **embedded sensors and open source conversation theory**

Gordon Pask's concept of 'generative activity that gives identity to participants and leads to the generation of new ideas' (Bullivant 2007, 11) in contrast to typical 'communication' that relays already known information without providing for learning or revealing.

### **cybernetics**

Control and communication in animals and machines, 'techno-biological' (Bullivant 2007, 31).

### **computer-human interaction (CHI)**

Discipline concerned with design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them (McCullough 2004); design, evaluation and implementation of interactive computer systems for human use.

### **ubiquitous**

Everywhere, constant, embedded. Hundreds of computers per person (McCullough 2004, 5).

### **open source**

Source code accessible to all, still has license; constructing architectural environments that are themselves collaboratively and iteratively produced by people who inhabit a space (Bullivant, 2007, 26).

### **pervasive computing**

Numerous casually accessible often invisible computing devices, frequently mobile or embedded in the environment, connected to an increasingly ubiquitous network structure... self organizing, robust, renewable (McCullough 2004, 7).

### **smart community**

Community that has made conscious effort to use information technology to transform life and work within its region in significant and fundamental rather than incremental ways (Intelligent Community Website 2008).

### **usability**

Ensuring that interactive products are easy to learn, effective to use, and enjoyable from the user's perspective (Preece 2002, 14).

### **user**

Public/private vs commons: public space is private, still has issues; commons "defined by the rights that people have within it rather than by the restrictions" (Bullivant 2007, 30).

## **landscape architecture**

Understanding the shift from traditional landscape architecture to contemporary dynamic processes.

## **landscape**

Landscape is the primary ordering device of the city. "The landscape itself is a medium through which all ecological transactions must pass, it is the infrastructure of the future and therefore of structural rather than (or as well as) scenic significance" (Weller 2006, 73).

As a framework for the imagination, landscape produces new insights in response to the contemporary urban situation (Mostafavi 2003, 7).

Landscape "offers direction because of its extensive scale and scope, its inclusive pragmatism and creative techniques, its prioritization of infrastructure and process, its embrace of indeterminacy and open-endedness, and its vision of a more wholesome and heterogeneous world" (Corner 2003, 62).

The term landscape no longer refers to prospects of pastoral innocence but rather invokes the functioning matrix of connective tissue that organizes not only objects and spaces but also the dynamic processes and events that move through them (Wall 2003, 233).

If we think of landscape as an infrastructure which underlies other urban systems, rather than equating it with nature or ecology we have a much more workable conceptual framework for designing urban systems (Mossop 2006, 176).

## **landscape urbanism**

Combination of biology and technology to spawn biotech, or of evolutionary science with business management to produce organizational dynamics (Doherty 2003).

Common practice and focuses include:

1. Increasingly decentralized cities, such as the post-Fordist landscapes of urban edges and the low density landscapes that the majority of us now live in, and enjoy living in (over 60% of Europeans live outside traditional city cores). While cities are spreading, the countryside is becoming increasingly urbanized. Decentralized landscapes are increasingly important for the practice of industry, commerce and everyday life.
2. Brownfield and former industrial sites that are usually outside the purview of traditional development.
3. Large-scale infrastructures and the integration of landscape with these infrastructures to create new hybrid forms of public spaces, and
4. Landscape as a remedial agent within urban areas, in the developing as well as the developed world, as championed by Kenneth Frampton.

Landscape urbanism "suggests neither a new formalism nor a renewed emphasis on landscape in the city. It is not a theory of design but promises to innovate at the level of design practice" (Hight 2003, 22).

Landscape urbanism blends market-based real estate, community activism, environmental issues, and political issues that planners must develop; reduces the blurring of nature-culture; dismantles hierarchy, boundary, center; focus on "indeterminacy, open-endedness, intermixing and cross-disciplinarity" (Corner 59, 2003).

### **landscape urbanism [continued]**

Landscape urbanism is therefore not just about high-density urban areas and civic spaces, it is about the entire landscape off which the contemporary global metropolis feeds and into which it has ravenously sent its rhizomatic roots (Weller 2006, 75).

Landscape urbanism is meant first and foremost to decipher what happened in city landscapes of the last decades and to consequently act upon them (Girof 2006, 89).

### **master plan**

“The masterplan provided the vehicle for holding these functions together while nevertheless ensuring that they remained distinct and apart...in the new city, everything had to be ordered and precise in its relationships to other functions. This would allow the plan to be implemented in distinct phases over time. There was little room for the uncertainty of chance encounter, or the unpredictability of the unplanned. Planning became synonymous with certainty; freedom was what it curtailed” (Mostafavi 2003, 5).

Landscape urbanists would argue that the master plan has lost relevance as a design device for increasingly distant communities, increased technology and decreasing centralization, and loss of definition of what is meant by the term city.

### **milieu**

French; suggestive of the physical or social setting in which something occurs or develops.

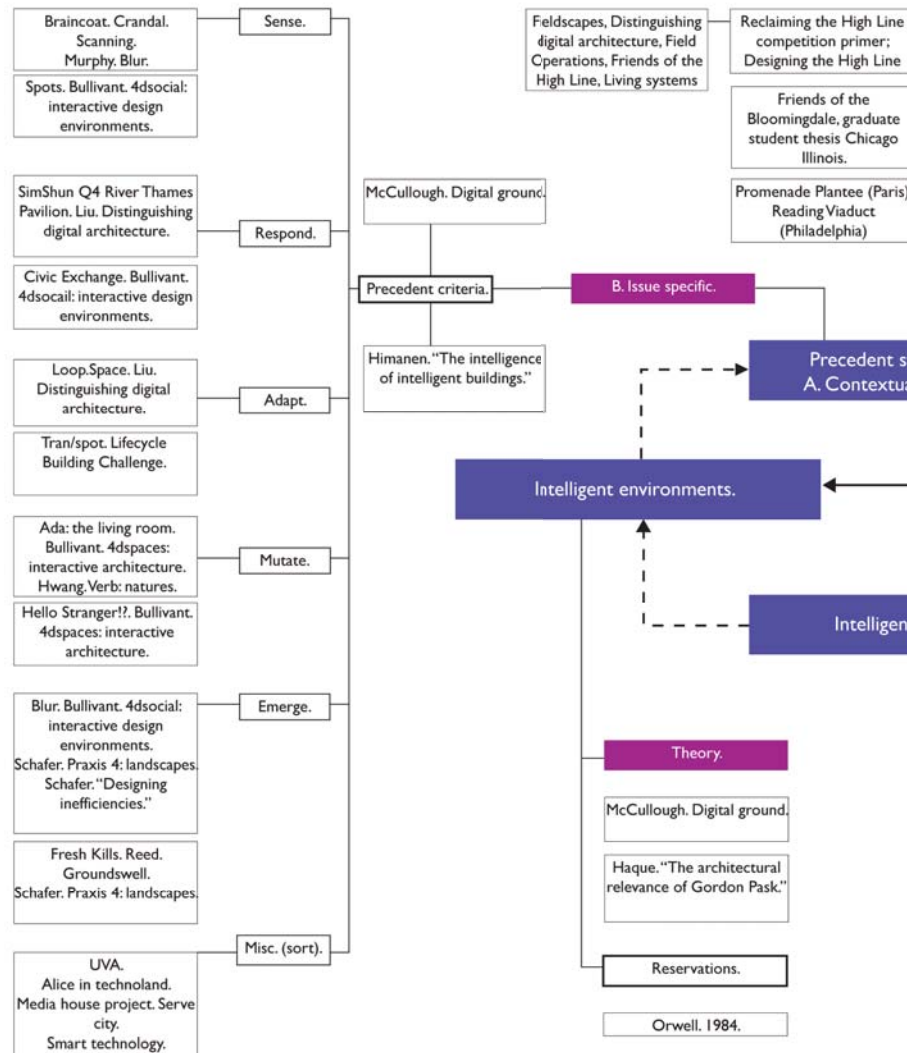
### **multi-disciplinary**

Though suggestive of several (multiple) professions (disciplines), the term multi-disciplinary roots for landscape urbanism is asserted as to have “emerged from a perceived crisis in which the traditional disciplines of architecture and urbanism are thought to be incapable of engaging the contemporary built environment...Only by producing new fields, methods and objects might we be able to understand the contemporary post-metropolis as a coherent entity. Thus, beneath the renewed interest in landscape lies an implicit assertion that bringing the design practices of urbanism and architecture into contact with that of landscape will rejuvenate all three” (Hight 22, 2003).

### **transformation**

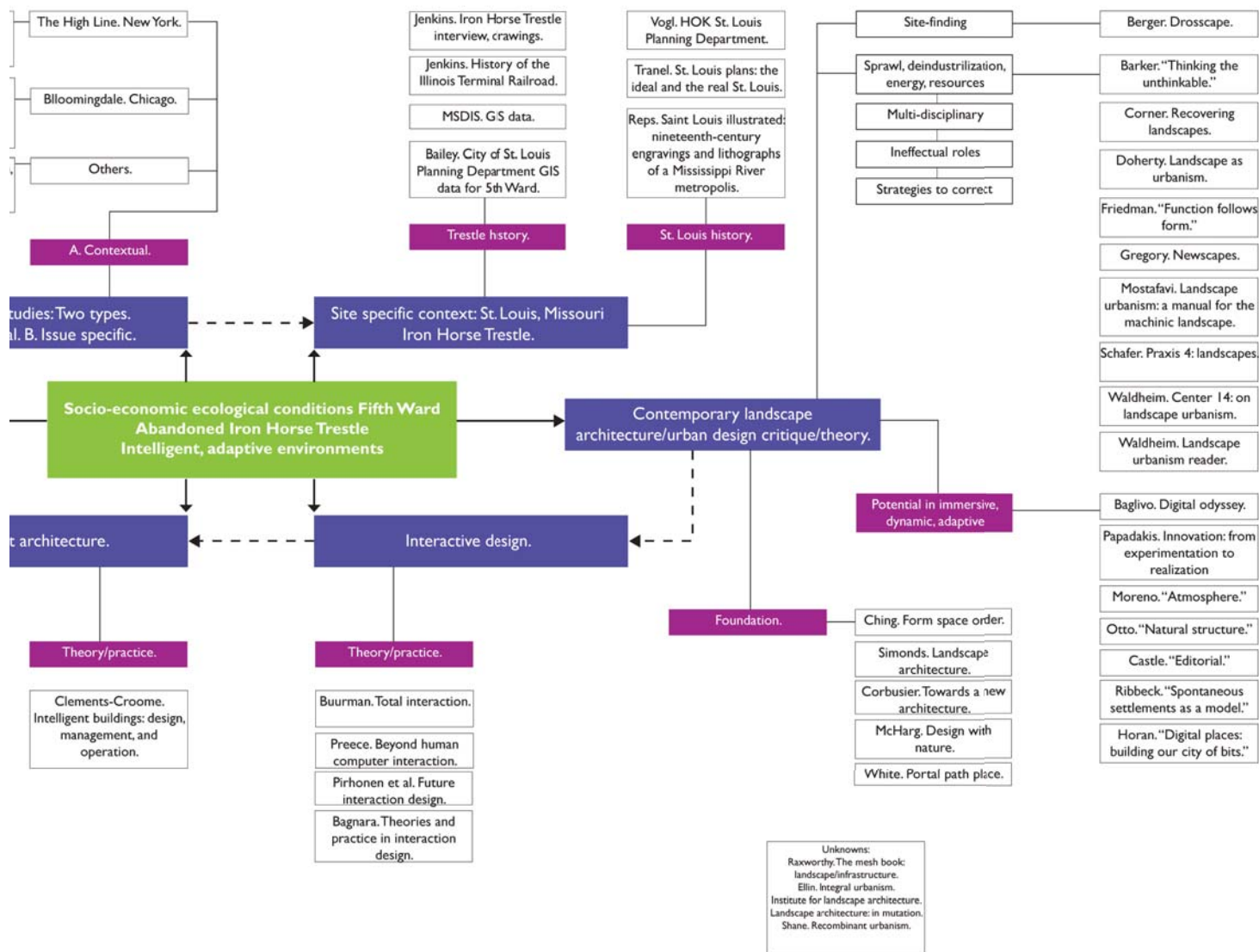
The principle that an architectural concept, structure, or organization can be altered through a series of discrete manipulations and permutations in response to a specific context or set of conditions without a loss of identity or concept (Ching 1996, 321).

## literature [literature map]



Research began as an investigation of contemporary landscape architecture theory, most notably those dealing with complexity, unpredictability, and adaptability within dynamic, rapidly evolving urban and natural ecosystems. Coupled with previous project discovery of adaptive systems in architecture, inquiry further evolved with the discovery of the impact of interactive exhibits (interior and exterior) and intelligent architecture (specifically buildings), noting the potential link between small-scale exhibit design and larger environments.





The link thought to exist between *interactive* objects and *intelligent* structures led to the formulation of a theoretical hypothesis that small-scale interactivity and intelligence could be created at a larger scale. What then is the potential benefit of an intelligent adaptive environment in solving urban issues? Can the conceptual framework redefine our idea and ability to enable inclusive public open space design? See f 4.2.

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# H I S T O R Y



**appendix [history]**



## founding of st. louis

Requiring an optimal commercial depot for fur trading, Pierre Laclede Liguist founded the city of St. Louis in December of 1763, thirteen years prior to the signing of the Declaration of Independence, in an area not subject to flooding and near the confluence of two major transportation rivers – the Mississippi and Missouri.

Horse drawn omnibuses, began in 1844, served as the first mass transportation lines which slowly transformed into horse car lines on rails, cable cars, electric trolleys, and buses with the last streetcar line disappearing in 1966.

These transportation lines, intended to distribute residents into and through the central business district, fed into what is the present day 5th Ward. By the mid 1960s, various factors emerged, including:

- after-effects of bootlegging, world wars, and the resultant influx of immigrants primarily of German, Irish, Italian, and Polish decent;
- growth of tenement housing for immigrant laborers and the negative perception surrounding the areas north of the city of St. Louis proper; and
- the acquiring of slum-like status with increasing business and residential vacancy by the mid 1960s – had “descended to the depths of depravity and crime...in conditions of indescribable filth, promiscuity, and disease” (Wayman 1979, 7), with areas receiving such names as Castle Thunder, Clabber Alley, and Wild Cat Chute.



f 4.3 aerial perspective of st. louis riverfront during industrial period. image source reps 1989



f 4.4 st. louis industrial riverfront in 1896. original image courtesy fred graf and maps of the library of congress. image source reps 1989

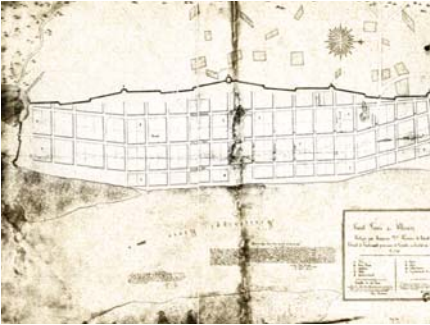


f 4.5 st. louis aerial perspective in 1896. original image courtesy charles jehune and maps of the library of congress. image source reps 1989

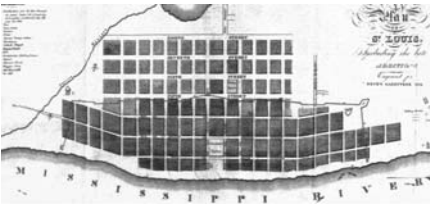




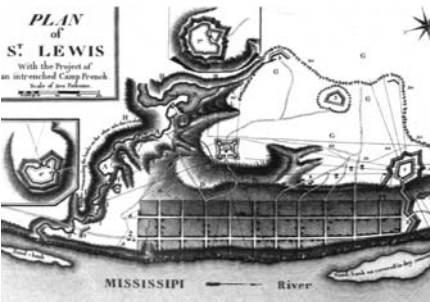
f 4.6 historical imagery of industrial st. louis riverfront. image source reps 1989



f 4.7 1780 manuscript plat of st. louis. original image auguste chouteau. courtesy of the missouri historical society. image source reps 1989



f 4.7 1822 map of st. louis. original image lewis caleb beck. courtesy of eric evelyn newman collection. image source reps 1989



f 4.8 1796 map of st. louis. original image george debois. courtesy of library of congress. image source reps 1989

## fifth ward

Present-day Old North St. Louis and sections of Hyde Park has been transformed from what was once a primarily residential section into current commercial and industrial development. The former Near North Side, present-day Near North Riverfront, transformed from residents into a currently thriving commercial and industrial quarter.

Are these necessary conditions? Does what exist currently suggest the best possible use? Old North St. Louis (though not comprising the entire section of the Iron Horse Trestle) developed as what was noted “unlike most of the subdivisions created in the twentieth century...developed as a mixed-use neighborhood” (Rectenwald 2004, 56) with residential, commercial, and industrial components abutting each other.

This suggests that St. Louis, and particularly the 5th Ward, was founded upon the need to balance easily accessible community services and walkable pedestrian oriented necessities within proximity to commercial and industrial growth. Transportation access to residents of that period relied extensively on streetcar and public bus mass transit systems. Thus the construction of additional lines and service would seem quite beneficial.



f 4.9 1876 aerial map of st. louis. original image ck lord. courtesy of library of congress. image source reps 1989

## improving transportation

The founding of the McKinley Bridge and rail lines was based upon the need to improve pedestrian and freight service from the central business district to and from East St. Louis. Typically, passengers had to arrange for separate travel between St. Louis and East St. Louis while freight had to be hauled by wagon across the Eads Bridge before being loaded onto lines operated by the Illinois Traction Service, noted as “an expensive and slow proposition at best” (Jenkins 2005, 82).

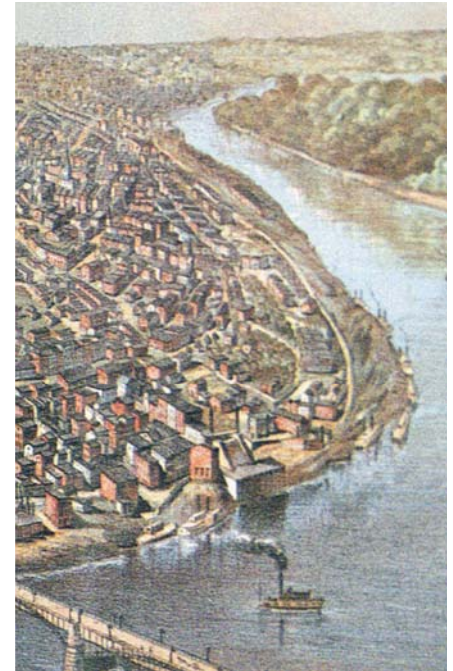
The Terminal Railroad Association, owners of the Eads Bridge, already carried steam road trains and streetcars, and prohibited the addition of Illinois Traction Society-owned cars to facilitate service between the Tri-Cities of Venice, Madison, and Granite City, East St. Louis, and St. Louis city. In order to add interurban services, the construction of a new bridge, new lines, and new terminal was undertaken by McKinley.

## iron horse trestle elevated interurban railroad and subway

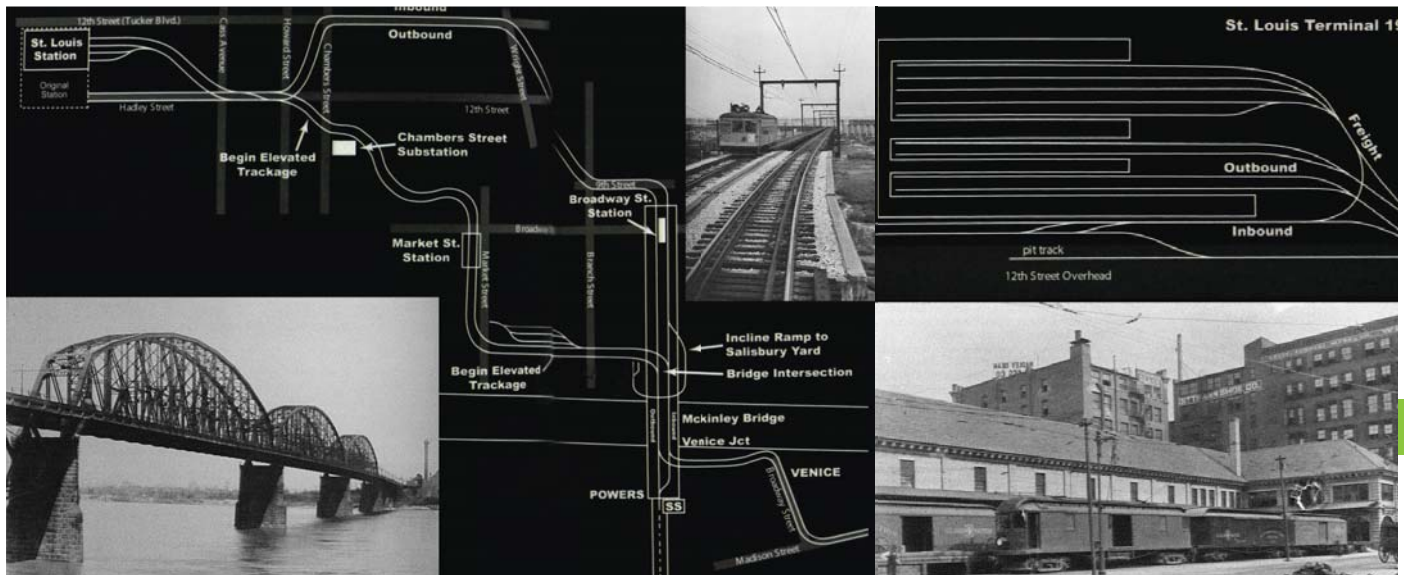
A new, approximately 2.5 mile rail line from downtown St. Louis at 12th and Lucas to the approach of the new McKinley Bridge as well as the express freight terminal, passenger terminal, and Salisbury Yard bulk freight house and yard was commissioned to be built under the St. Louis Electric Terminal.

The McKinley Bridge, which at the time was the only privately owned railroad bridge across the Mississippi River, was commissioned to be built under the St. Louis Electric Bridge Company. Both were separately incorporated companies yet still owned by the McKinley Syndicate.

McKinley Bridge was to have a carrying capacity of 12000 pounds, was 8000 feet long with three through truss spans and a bridge deck width of 65 feet, constructed at a cost of \$4.5 million, and had its inaugural run on September 21, 1910. The terminal site at 12th and Lucas was located within the wholesale and retail district, and was closer in proximity to the city center than Union Station.

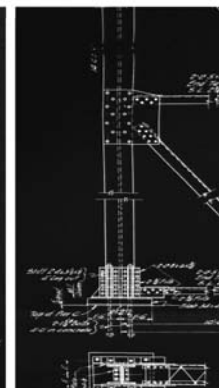
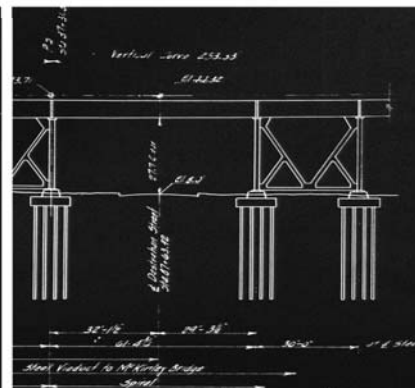
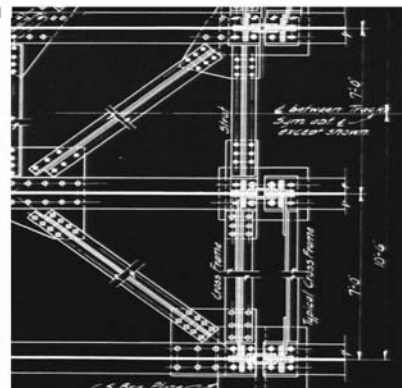
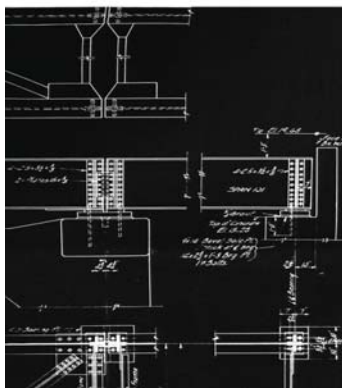
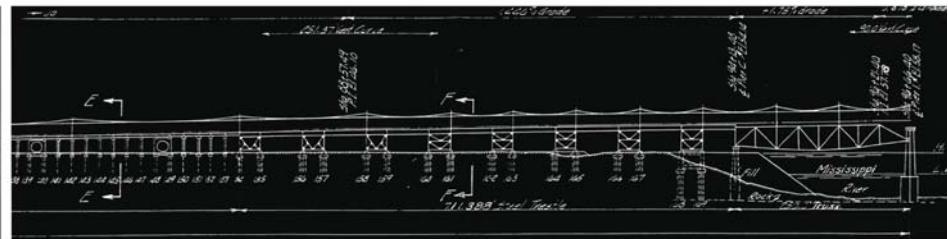
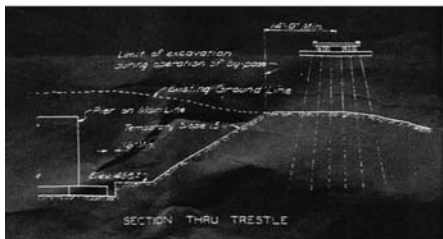
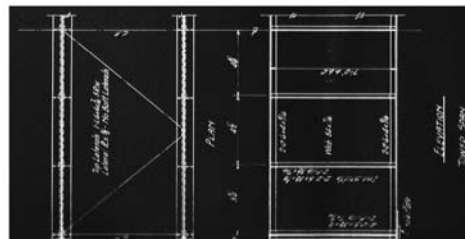
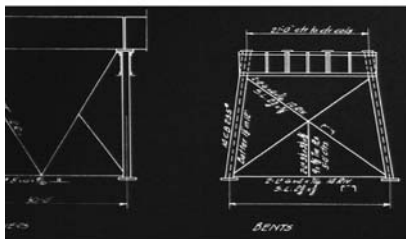
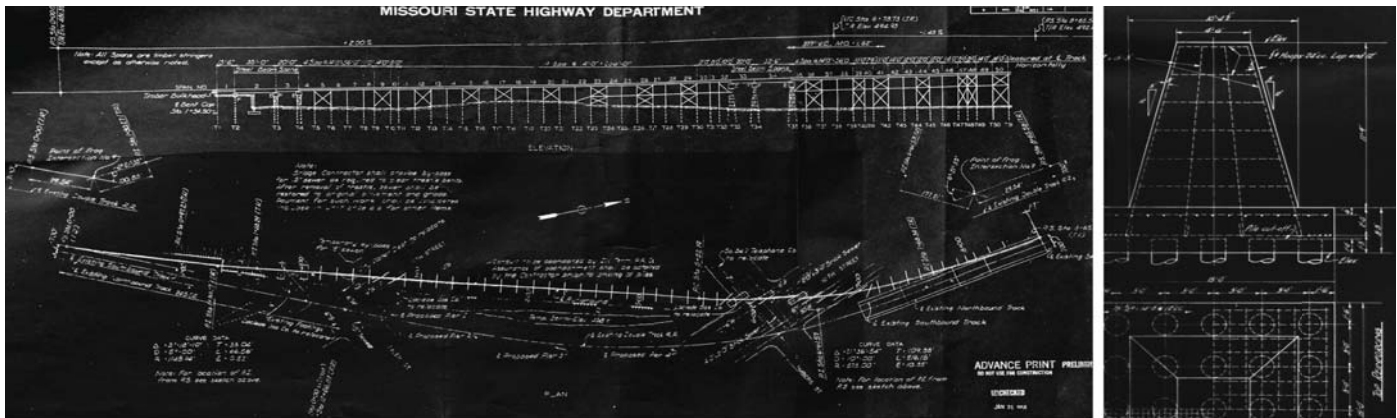


f 4.10 rendering of industrial riverfront. image source reps 1989



f 4.11 diagrammatic rail track layout and associated historical site imagery. image source jenkins 2005





### services and facilities

A temporary passenger station was built next to the future property for the Midwest Terminal Building, and served as the main facility from 1911 to 1930. The station, an L-shaped buffed brick-and-stone building, was the largest on the ITS system, capable of holding twelve cars on three tracks – yet express trains were limited to sharing facilities with passengers and prohibited by the city to carry more than one car at a time; steam road freight equipment was outright prohibited.

Again, similar to McKinley's initiative to construct a new bridge and adjoining lines, McKinley avoided city ordinances in his endeavors. Pull motor 1514 is a primary example, "designed to appear as a passenger motor to circumvent a St. Louis city ordinance that restricted movement of express trailers and motors through the city" (Jenkins 2005, 83).

Lastly, the Broadway Street station, a two-story, 65 by 150 foot dark brick building was constructed to facilitate passenger distribution and Salisbury Yard's 24 acres and 800 car capacity connected with the Terminal Railroad Association of St. Louis to allow interchange with other steam roads.

The elevated portion bypassed the Broadway Street station, which was subsequently closed and razed. A replacement depot was erected at the Broadway and Market Street intersection. The rail was elevated on its approach south to Salisbury Yard from McKinley Bridge, dipped to ground level to a sawback connection at Salisbury Yard, remained elevated southwest until it approached Hadley Street connecting to the former main lines at ground level for six blocks of street trackage, and submerged to subway at Cass Avenue and continued south five blocks to Franklin Avenue under the new Midwest Terminal Building.



f 4.13 interurban tram headed north above market street and broadway intersection. image source stringham 1989

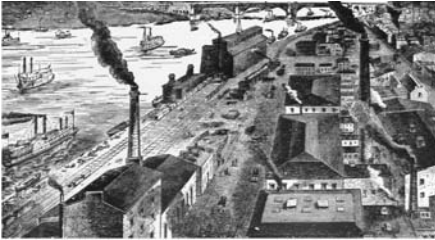


f 4.14 interurban tram northeast along mckinley bridge tracks. image source stringham 1989





f 4.15 interurban tram emerging from subway entrance south of cass. original image bill janssen. image source stringham 1989



f 4.16 black white rendering of industrial portion of old st. louis. original image 1883 by hubbard brothers. image source reps 1989

## subway

The subway improvement was a three-track operation with one inbound and outbound lines, and one for freight. The subway allowed for increased freight and passenger distribution towards downtown; provided revenue with air rights sold to property owners over the subway line with some areas dropping freight elevators directly down to the subway level; featured a catenary system for both wheel and pantograph operation; and had its own substation at 10th and Chambers Street.

Notice the congratulatory and positive statements offered by businesses of the time. Realizing the need for change but perhaps not the resultant displacement and negative consequences, the businesses knew that in order to progress, advances in service and infrastructure needed to occur. A subway line was viewed as a technological advancement, one that could ultimately benefit the city, its economy, and in turn, its citizens.

The combination elevated, subway, and surface trackage of approximately 2.5 mile, double-track, high-speed mainline (termed the Iron Horse Trestle) eliminated 29 grade crossings, reduced streetcar crossings from eight to one, and increased running time by seven minutes. Prior to its construction, trains entered along a mostly street route between McKinley Bridge and the Franklin Street station in downtown St. Louis.



f 4.17 interurban tram northeast along mckinley bridge tracks. image source stringham 1989

f 4.18 interurban rail at broadway street depot. image source jenkins 2005

These pages contain a few of the many expressions of commendation and endorsement made by representative St. Louis business concerns and individuals who appreciate the importance of this development to the civic and business interests of St. Louis.

I have noted with interest the new developments sponsored by the Siltone Power & Light Company through the Siltone Thermal Company. I have followed these developments with great interest, as evidenced in the newspapers and on quite occasion to see the greatest control of the city. I believe this would be very beneficial to the City of St. Louis is shown.

Furthermore, knowing the company as I do, I think it would help to develop the city of St. Louis. For these reasons, I hereby endorse the program and believe your company to be the most important in the efforts along this line.

Very truly yours,

**LIBERTY CENTRAL TRUST COMPANY**

Some  
Unusual  
Benefits  
Which  
Are  
Yours—

—If the Illinois Traction System builds its magnificent electric terminal at Twelfth Street and Washington Avenue.

—As seen by your business men  
and citizens with a vision for  
your future.

Mr. Lantz and immediately North St. Lantz should be highly valued since the transportation improvement will forward economic and passenger facilities which the Medicine Branch expects to make.

We who are very much interested in the development of the City of Medicine and the welfare of our citizens, feel that this plan will be a great step just another stride forward in the rapid development of our City.

The property owners of the section of the City through which your proposed street will cut, will be glad to have the street widened to 40 feet.

We demand the business to be open for commercial and industrial purposes.

To the manufacturer it opens up a large field for the rapid recovery of his product and allows him to market his goods better in local supply from traffic.

The citizens of St. Lantz are a whole doing good behind this wonderful development.

Very truly yours,  
HARTWIGER-CHENIER REALTY CO.

[illegible]

## Start Work On St. Louis Terminal Subway

Just about a year ago, the **Illinois Terminal Railroad** would have been a name that only a few people in the Chicago area would have known. But now, after a long and hard **fighting** process of the courts and decisions of the banks, the Illinois Terminal Railroad is back on its feet. The Illinois Terminal Railroad is a subsidiary of the Illinois Commerce Commission and Illinois Public Service Company. It was created in 1982 to take over the Illinois Terminal Railroad's assets and liabilities. The Illinois Terminal Railroad is now a public utility and is owned by the Illinois Commerce Commission and Illinois Public Service Company. The Illinois Terminal Railroad is now a public utility and is owned by the Illinois Commerce Commission and Illinois Public Service Company. The Illinois Terminal Railroad is now a public utility and is owned by the Illinois Commerce Commission and Illinois Public Service Company.

## ELECTRIC TRACTION

North of the present station development is to be prepared at first, a large **unimproved area** of about 100 acres, which will be available for the organizations will be located and in which the problem with, regular business, may be managed, thus affording direct benefit to the waterfront for the handling of raw materials and also for the handling of finished goods.

A **large warehouse** of the type approximately 400,000 sq. ft. in area, with a large open space for the storage of goods, is being designed to meet other requirements of the waterfront and to permit the development of an entire area by the use of various of warehouse or other types of buildings.

**Eliminate Grade Crossings**

Under the plan, the **grade crossings** will be eliminated, and the street will be in a program which, when completed, will connect the waterfront with the city and the city with the waterfront, thus **eliminating the barrier** to access and remove the existing barrier to the waterfront.

[illegible]

f 4.19 1929 pamphlets expressing interest in subway creation. image source jenkins 2008

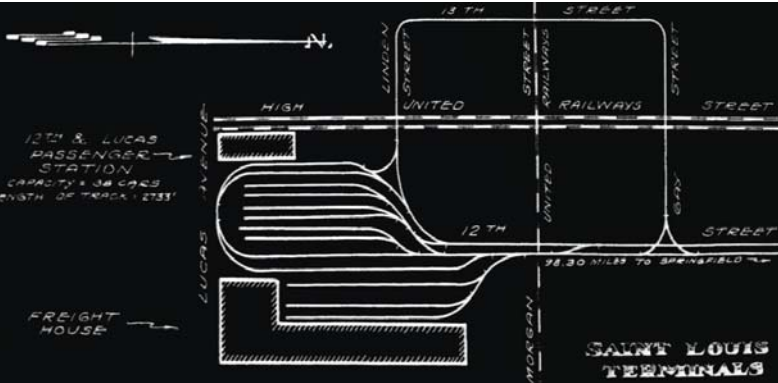
f 4.20 1929 pamphlets expressing interest in subway creation. newspaper article st. louis globe. image source jenkins 2008

f 4.21 diagrammatic track layout and route alteration. the elevated portion removed 29 grade crossings and dangerous intersections within typical residential districts. image source jenkins 2005





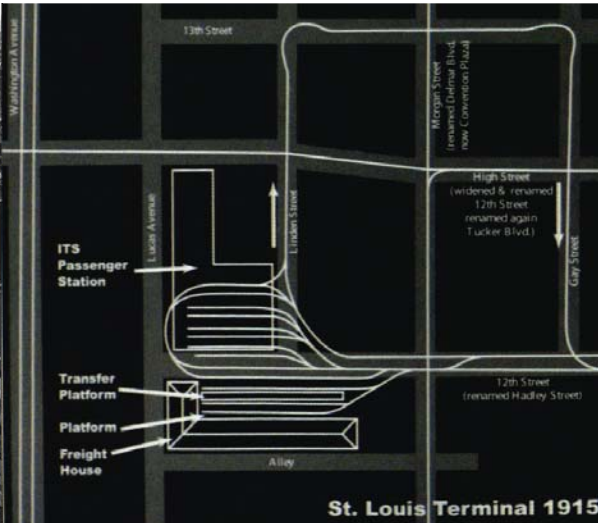
f 4.22 view southwest towards the previous Broadway street depot. image source jenkins 2005



f 4.23 st. louis terminal track layout with previous freight house location at 12th and lucas. image source jenkins 2005



f 4.24 view north from hadley street station along trestle tracks. image source jenkins 2005



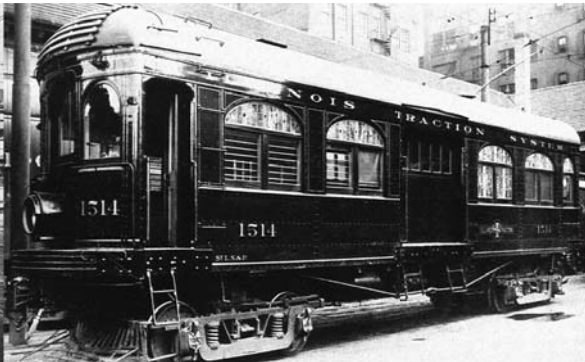
f 4.25 st. louis terminal in 1915. image source jenkins 2005



f 4.26 temporary passenger station that transformed into permanent station. image source jenkins 2005



f 4.27 streetcar running along tracks. image source stringham 1989



f 4.28 pullman car 1514. image source stringham 1989

**midwest terminal building**

The Midwest Terminal Building at 710 North 12th Boulevard was constructed on the site of the temporary passenger station, and was originally meant to be nineteen floors with basement and subbasement, approximately one million square feet of floor space, and twelve freight elevators, six high-speed passenger elevators, and forty-two receiving-shipping truck dock platforms with an additional combination passenger/office station; only seven floors were built and the additional building was not.

With freight to be handled at the new Midwest Terminal Building, passenger operations were to be replaced by a ten story structure, air conditioned, and serviced by tracks extending south to the proposed North American Building.

Unfortunately, similar to the proposed combination passenger/office building, the North American Building was never completed with halts in construction due to necessary building code changes.

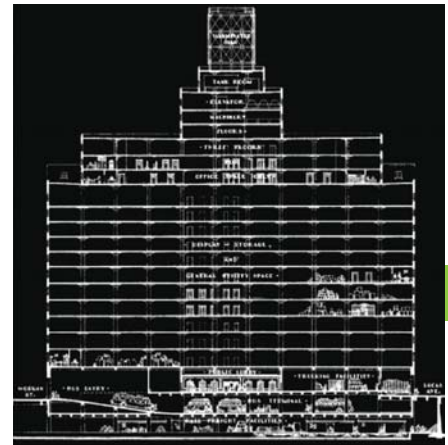
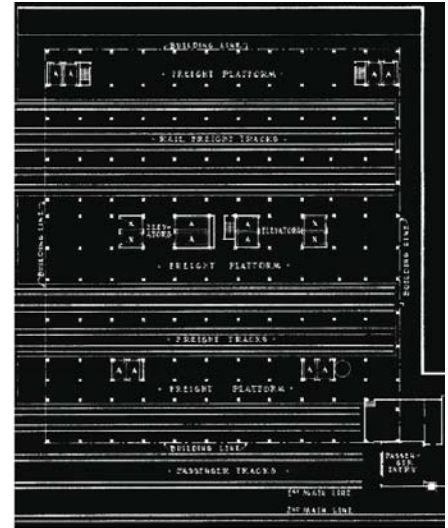
Passenger operations were then relocated to the freight-handling Midwest Terminal Building, which changed its name to Central Terminal and today serves as a multipurpose, mixed-use commercial building.

## conclusion

The erection of the McKinley Bridge and the subsequent Iron Horse Trestle elevated railroad line led to the creation of necessary pedestrian and industrial services, a transportation system that could traverse the industry-heavy riverfront, dangerous street-level rail intersections were eliminated within primarily residential neighborhoods, and less noise and physical pollution provided an enhanced living environment.



f 4.29 midwest terminal building rendering depicting artist's imagery of st. louis with new passenger terminal. image source jenkins 2005



f 4.30 plan, perspective, and elevation of planned midwest terminal building depicting tram and track layout. image source jenkins 2005





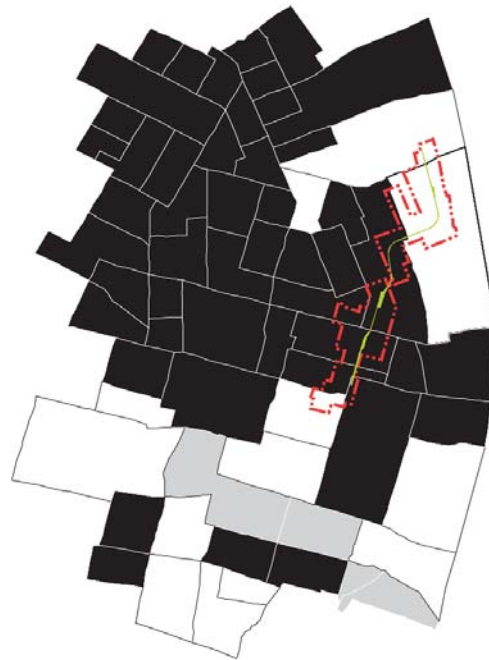
# P R O F I L E



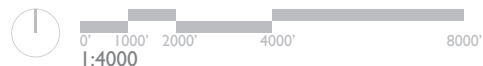
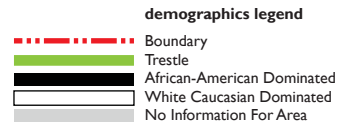
General overview of demographics of the Fifth Ward, including population distribution and trends, migration patterns, ethnicity, and rate of population change.

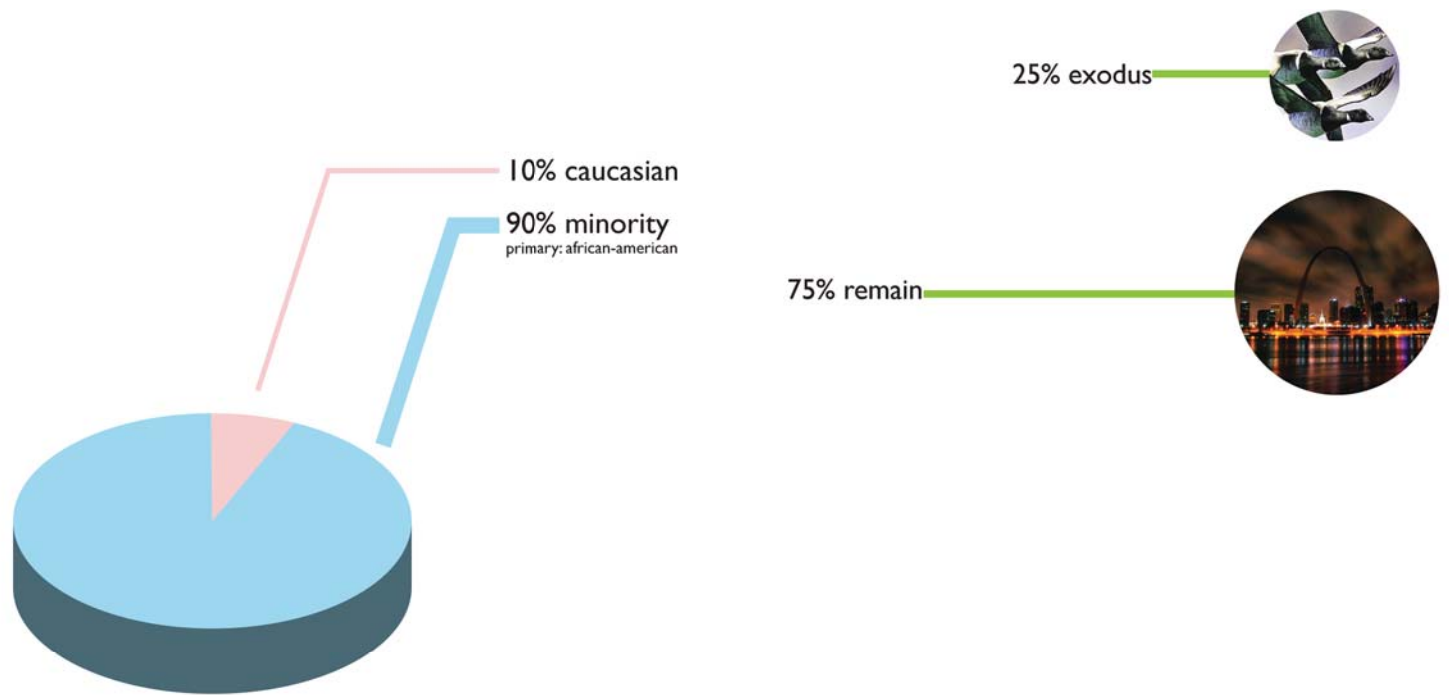
There exists a high percentage of minorities with majority of population moving from center city to suburbs (though residential trends suggest renewed movement inward to central business district). No significant difference in ratio of male to female. No significant rate of population change though trend suggests consistent decline.

Higher minority populations suggest a need for more site specific contextual design accommodated to specific groups and ethnicities, which could also be suggestive of growth trends, displacement, or gentrification. The Fifth Ward is primarily composed of an African-American majority at a ratio of nine to every ten being African-American. The majority of permanent residents are relatively new to the area having moved to the area after 2004. As residency increases, the opportunity to introduce and improve employment, housing conditions, and public infrastructure must increase in response. See f 4.3 I a, b.



f 4.3 I a demographics distribution pattern. illustration created by designer. information from msdis 2008





2% annual declining population

90% minority

25% ten-year decline

50% male, female

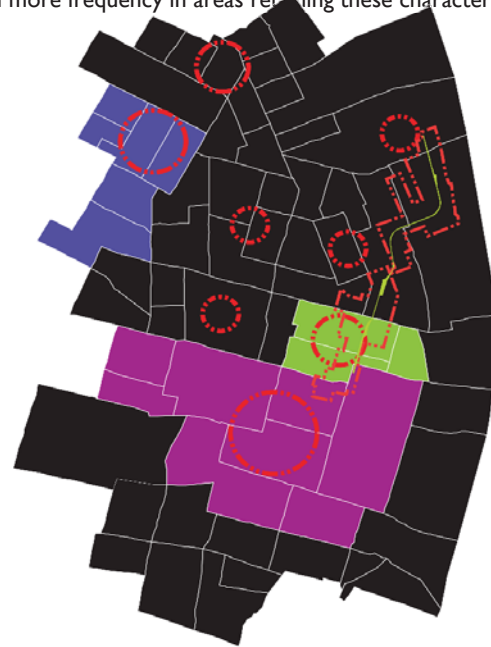
african-american majority

# demographics

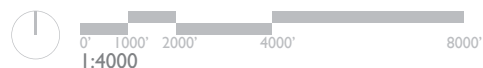
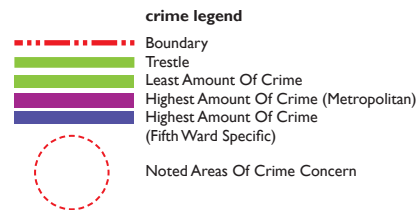
General overview of crime distribution within the Fifth Ward including the Downtown and Downtown West neighborhoods.

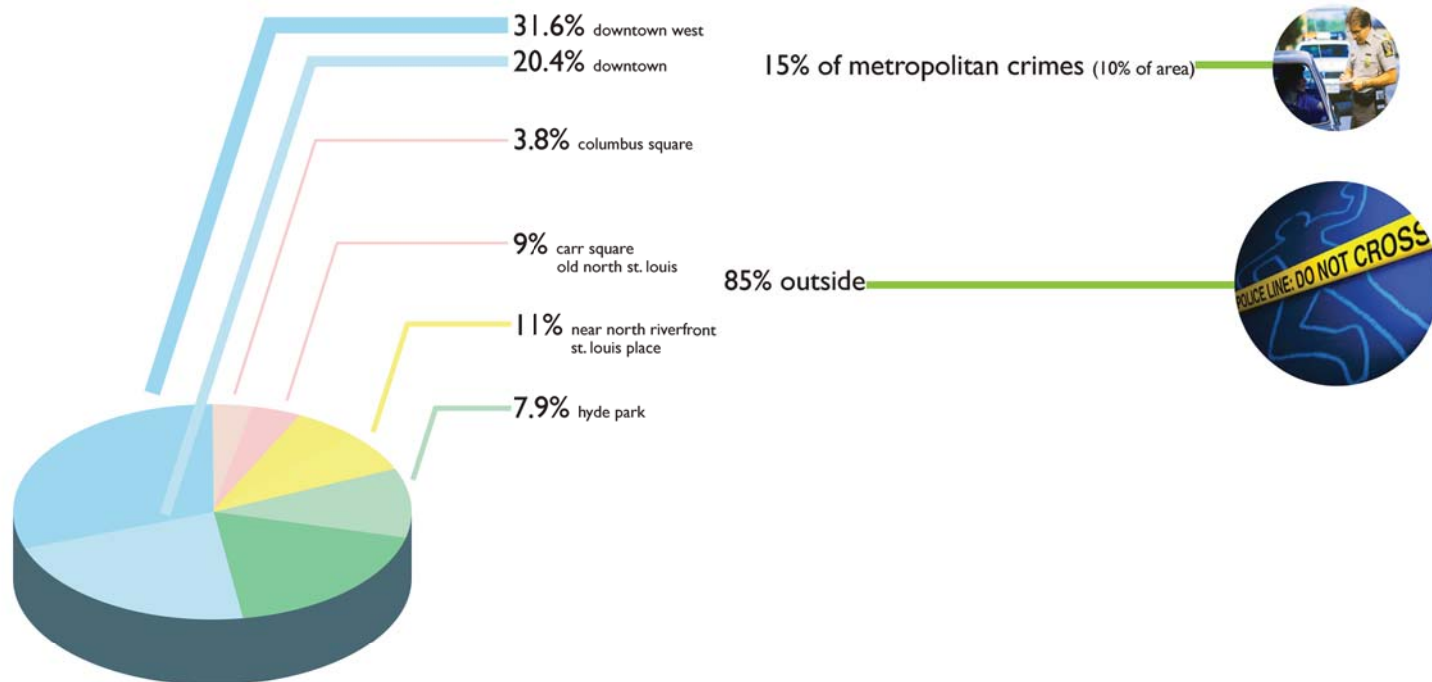
The majority of crimes committed within the Fifth Ward are non-violent. Jeff Vanderlou has the highest percentage of reported committed crimes within the defined boundary and Trestle line. Carr Square has some of the highest property values and is also the safest neighborhood in the Ward. While comprising about 10% of the surveyed metropolitan area for crime, the Fifth Ward reports about 15% of crimes. 15% of those crimes are violent (including murder, rape, robbery, and assault) and 85% are non-violent (burglary, larceny, auto theft, and arson).

No consistent crime pattern is identified within Fifth Ward. The ward's negative perception does not have justification throughout the whole ward; select areas are of higher concern than others. There is potential to redevelop and enhance the quality of life within these areas to reduce the occurrence of crime. Careful attention should be paid to areas with a higher volume of transient populations, failing infrastructure, and neglected structures as crimes seem to occur with more frequency in areas retaining these characteristics. See f 4.32a, b.



f 4.32a crime distribution pattern. illustration created by designer.  
information from msdis 2008



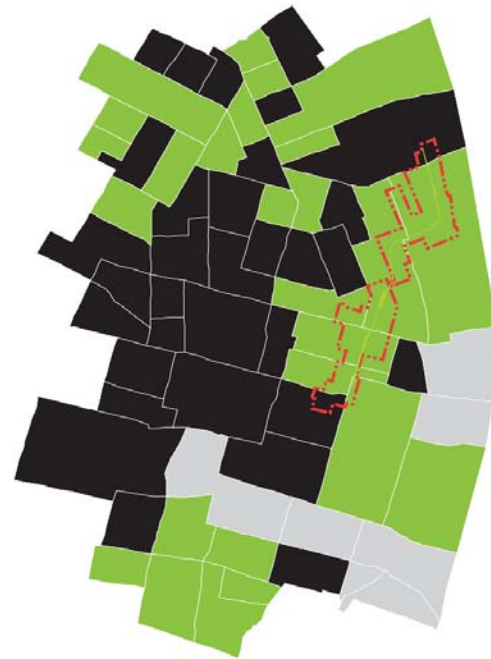




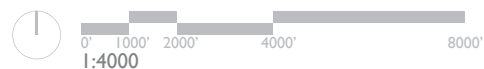
General overview of employment rates and potential worker base within the Fifth Ward including the Downtown and Downtown West neighborhoods.

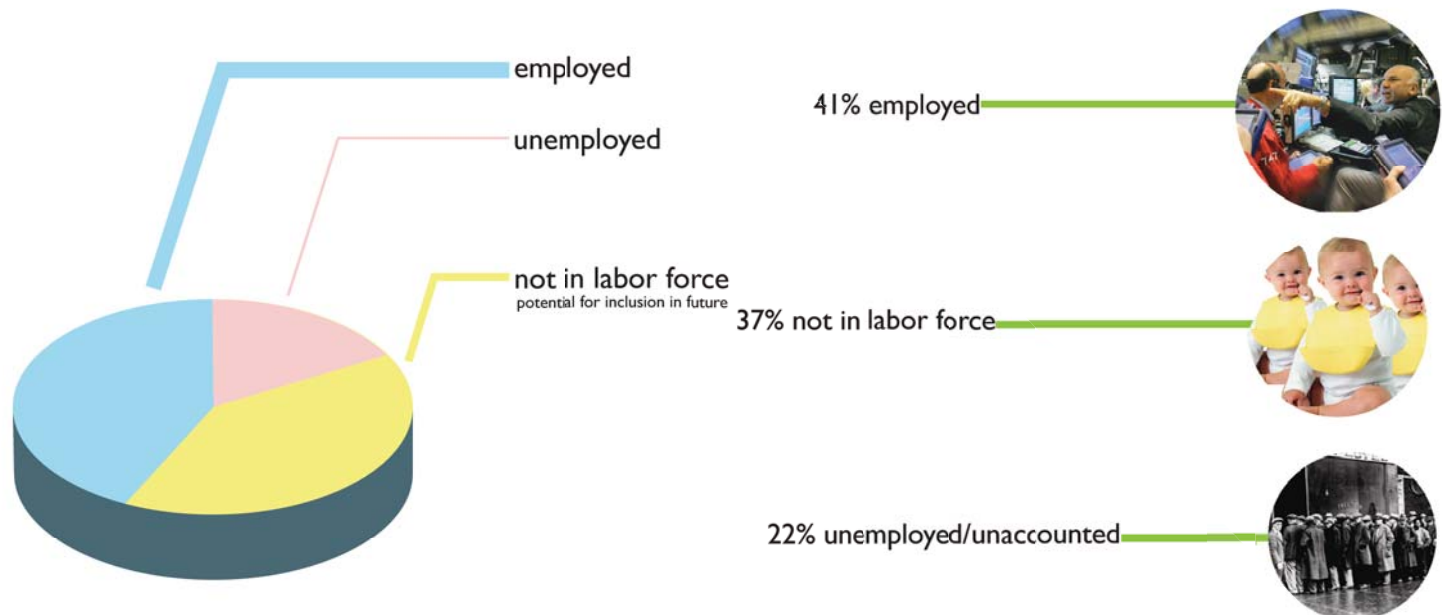
The majority of citizens are either employed as part of the work force or are not able to participate in the labor force.

A large majority of the population is considered “not in the labor force” which could include those under 18 or over 65, suggesting the potential for a younger worker base being established within the ward, a positive for future growth opportunities. See *f 4.33a, b*.



f 4.33a employment distribution pattern. illustration created by designer. information from msdis 2008





majority employed

# employment

communications public utilities educational service whole sale trade business and repair distribution and service

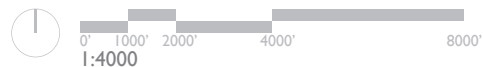
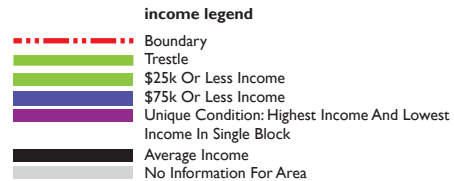
General overview of income distribution within the Fifth Ward including the Downtown and Downtown West neighborhoods.

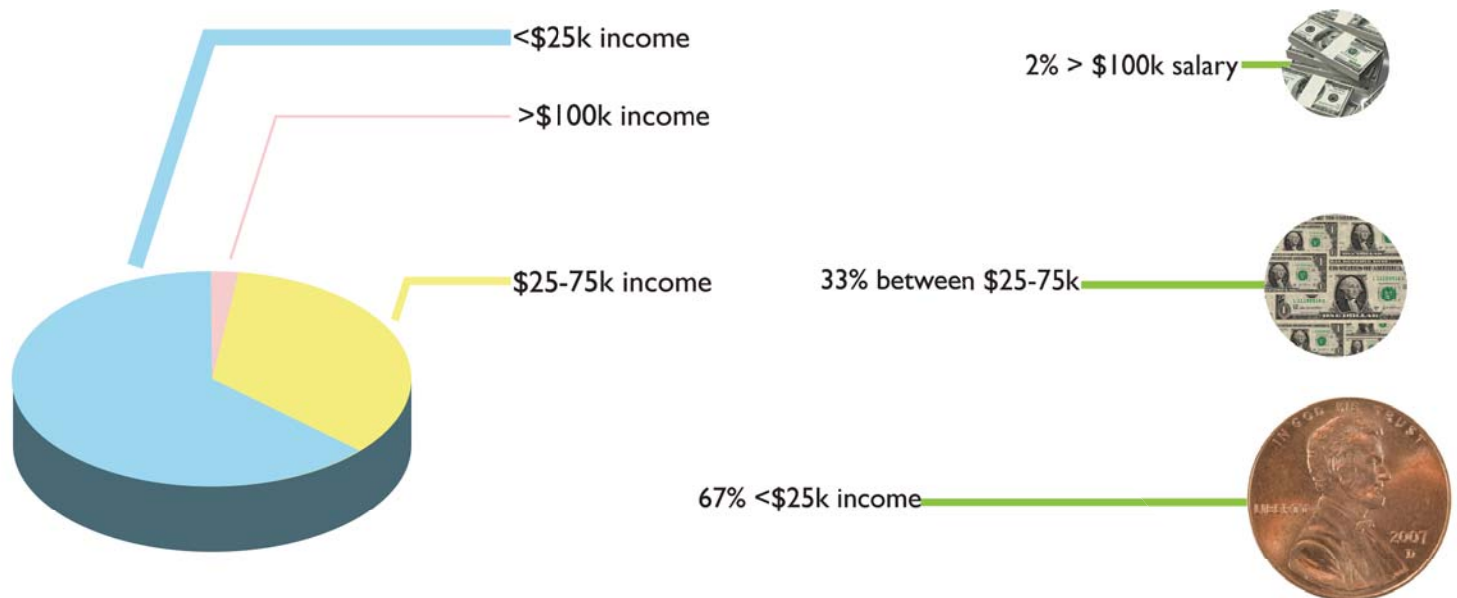
Salary compensation is highly variable throughout the ward. City average is approximately \$34-35,000; the Fifth Ward average is around \$20,000. Areas such as Carr Square have significantly higher income levels especially when compared to areas such as Old North St. Louis or the Near North Riverfront.

With the majority of salaries falling below the city average, positive district growth must be initially serviced by functional necessities (such as infrastructural improvements) prior to entertainment or commercial creation. There is not an employment issue but rather high compensation variation within the Fifth Ward. See *f 4.34a, b*.



*f 4.34a* income distribution pattern. illustration created by designer.  
information from msdis 2008





5th ward ave. \$19,718

city average \$34,390

largest and smallest income in same block group

majority < \$25,000

only 2% above \$100,000

# income

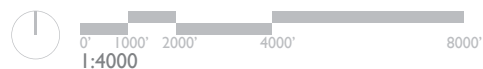
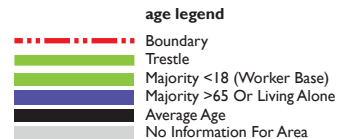
General overview of age distribution within the Fifth Ward including the Downtown and Downtown West neighborhoods.

The Fifth Ward is a generally younger to median age population (as inventoried for the 2000 census). If outward migration has not been a major trend, then the younger base can provide sustenance to this financially ailing community.

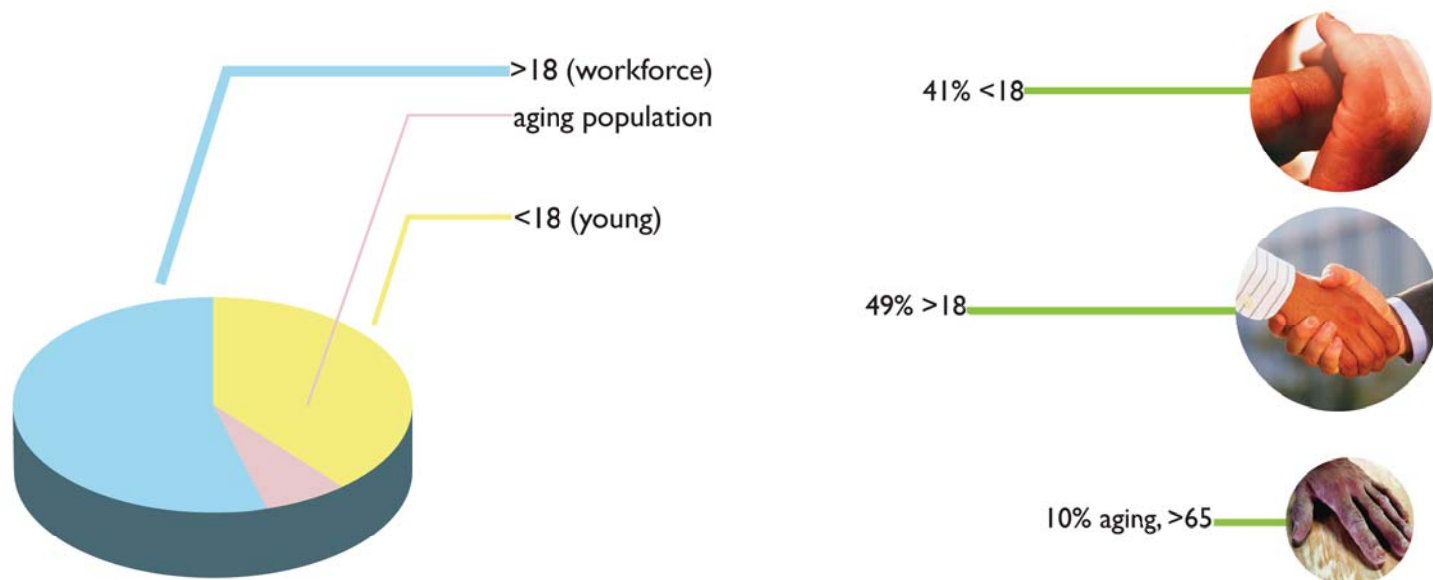
There is a lower ratio of aging population as compared to younger population (between 18-35). With employment creation, job placement, and increased salaries, residential opportunities will be made available to provide for live-work opportunities. See *f 4.35a, b*.



f 4.35a age distribution pattern. illustration created by designer.  
information from msdis 2008







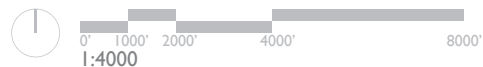
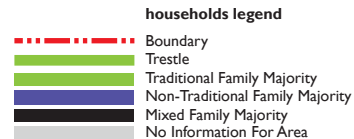
General overview of household distribution within the Fifth Ward including the Downtown and Downtown West neighborhoods.

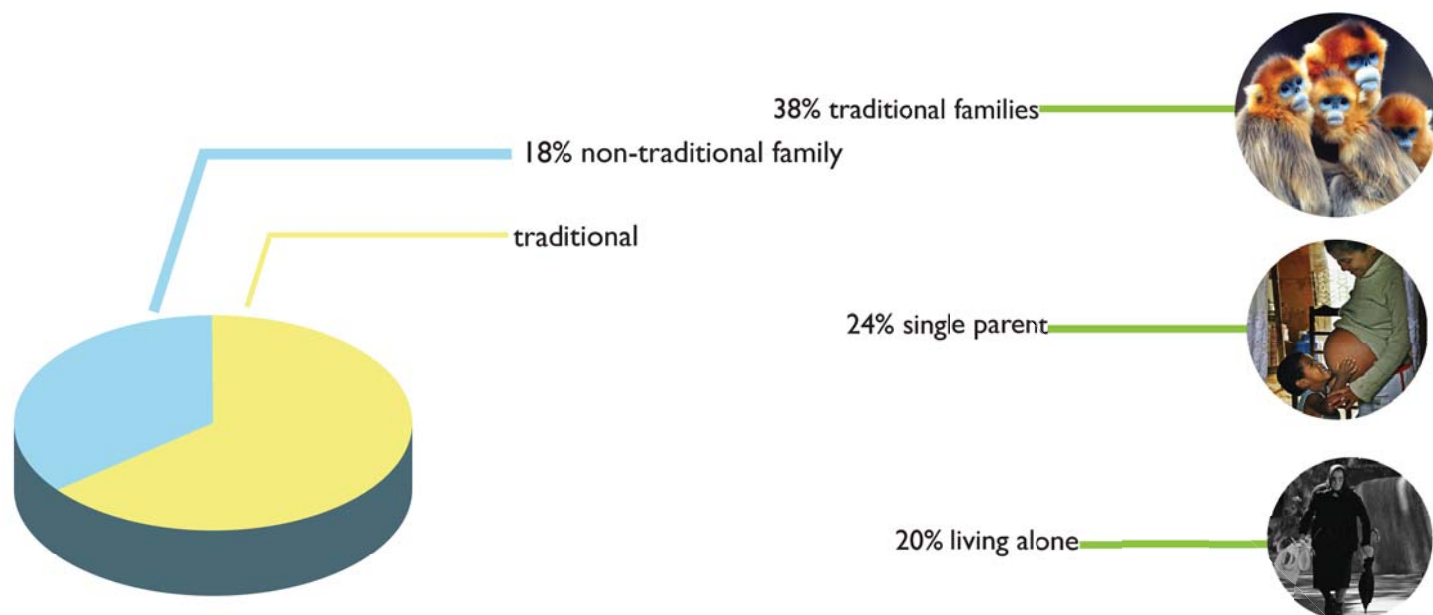
Generally, household types are relatively similar and equal, with traditional families and single parents (multiple styles) dominant. Living alone is popular among the aging population group as well as non-traditional families. The majority of people tend to be single at a ratio of eight out of every ten.

The higher traditional family and single parent family offers opportunities to incorporate younger more mobile lifestyles with stable older population groups. See *f 4.36a, b*.



f 4.36a households distribution pattern. illustration created by designer: information from msdis 2008





18% [various family]

majority families

households

38% [families]

24% [single-parent family]

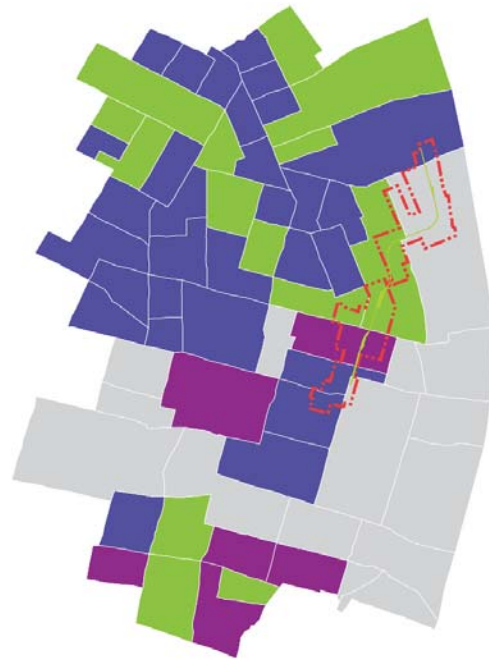
20% married, 80% single

20% [living alone]

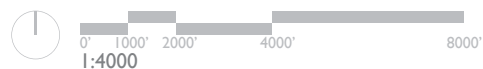
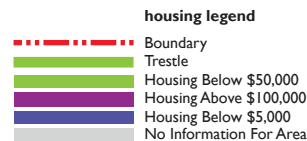
General overview of housing structure and property value distribution within the Fifth Ward including the Downtown and Downtown West neighborhoods.

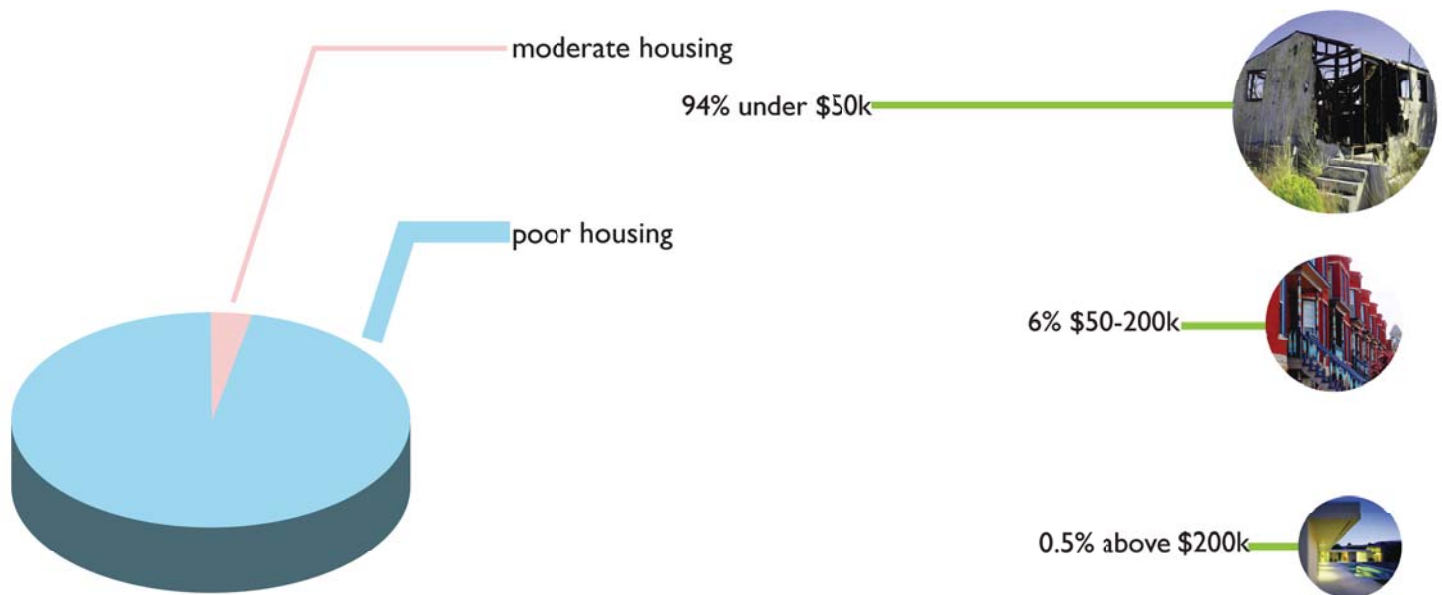
Generally housing is significantly lacking in maintenance, upkeep, or even whole supporting structures. The majority of housing is worth less than \$50,000. The community could use a large rejuvenation to fix issues with the designed environment.

There seems to be an unusually large quantity of neglected, structurally failing structures with the potential for adaptive reuse. Coupled with low income tendencies, the poor structural condition contributes to the negative misconceptions of the Fifth Ward. See *f 4.37a, b*.



f 4.37a housing distribution pattern. illustration created by designer.  
information from msdis 2008





fifth ward average [highly variable] \$20-100k **94% < \$50,000** 50% built before 1950

20% own 80% rent

need [density] **housing**

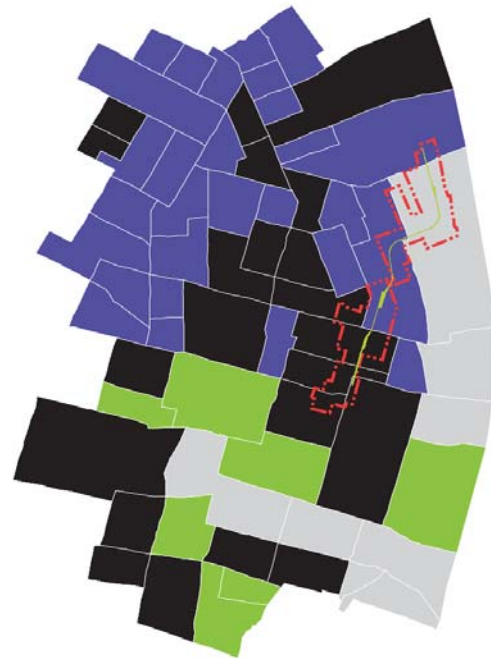
high mobility increase by 25% need [high and low income] no houses above \$200,000



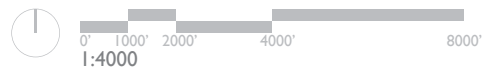
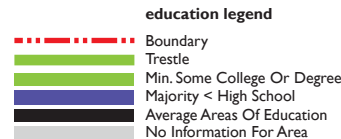
General overview of education (primary, secondary, post) within the Fifth Ward including the Downtown and Downtown West neighborhoods.

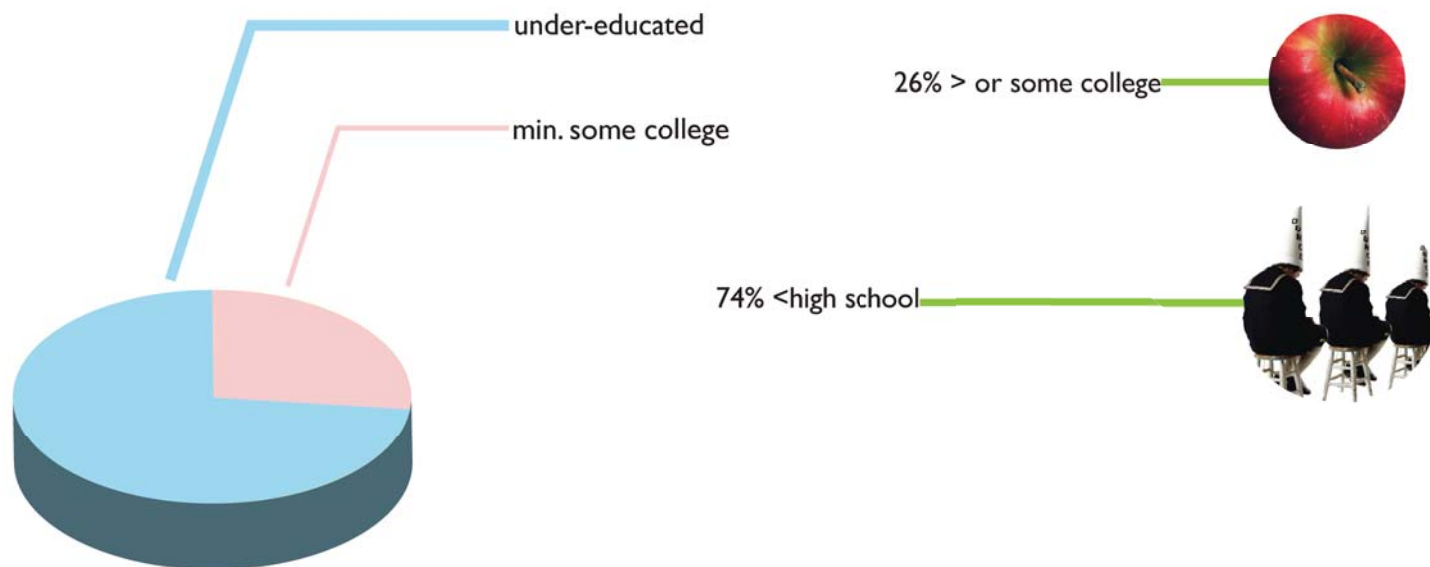
Generally, citizens have completed at least a minimum high school education level. Only about a quarter have had some experience to attaining college degrees as the majority of the workforce is primarily involved in service, distribution, or manufacturing agencies.

Education of students, teachers, workers, and residents enables progress. Incorporation of the academic community is essential to the successful constant use of the project. See *f 4.38a, b*.



f 4.38a education distribution pattern. illustration created by designer. information from msdis 2008







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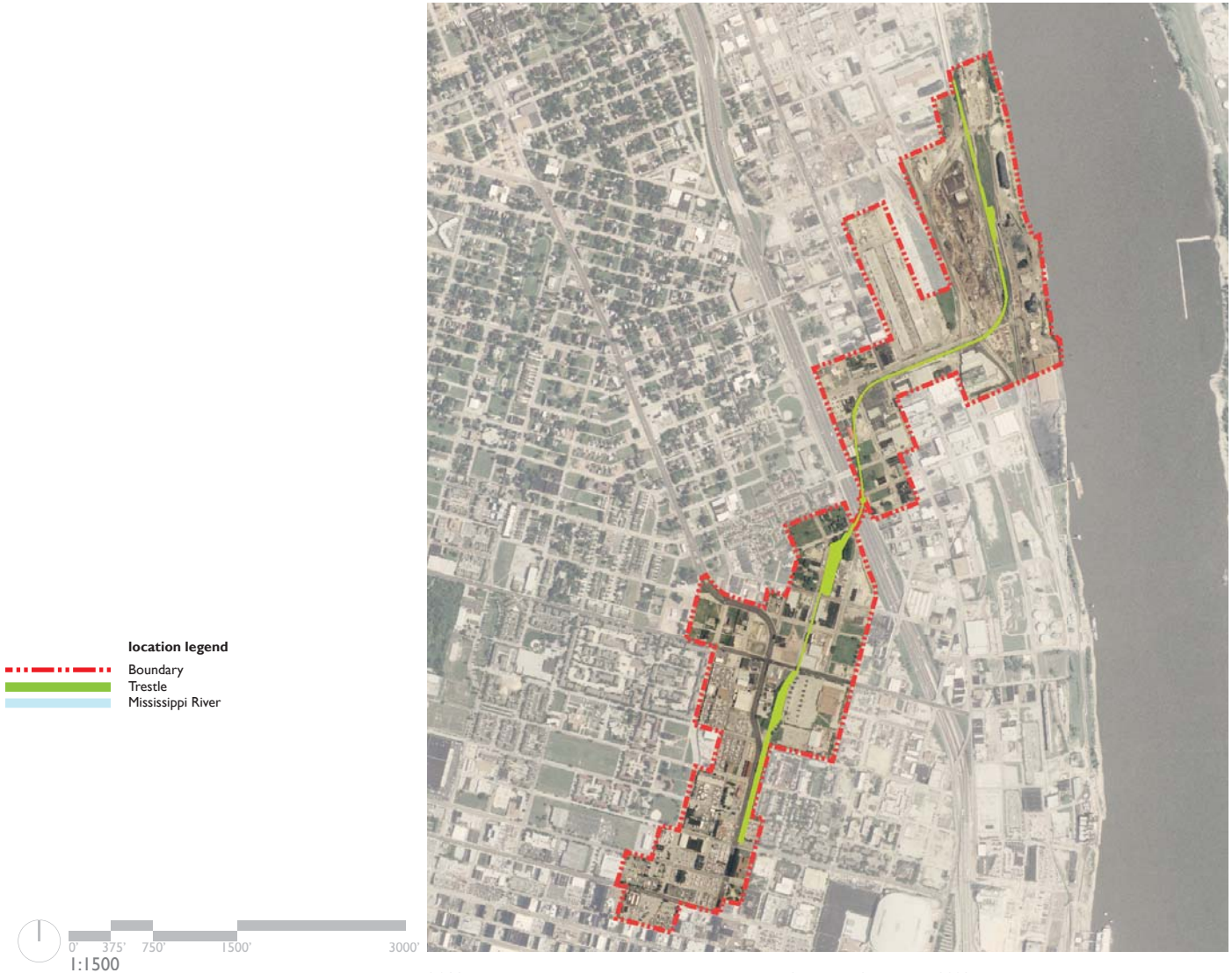


## location

Aerial imagery of downtown and central business district of St. Louis, Missouri, with connection north to Fifth Ward. Boundary outline and linear rail trail.

Site delineated is suggestive of areas with potential inclusion in design development. Images current to north connection at McKinley Bridge; since photographed, the Branch Street Trestle extension has been added (not pictured).

Aerial imagery provides contextual scale relationship for locating site. See *f 4.39*.



*f 4.39* aerial location map. image created by designer. information from msdis 2008.

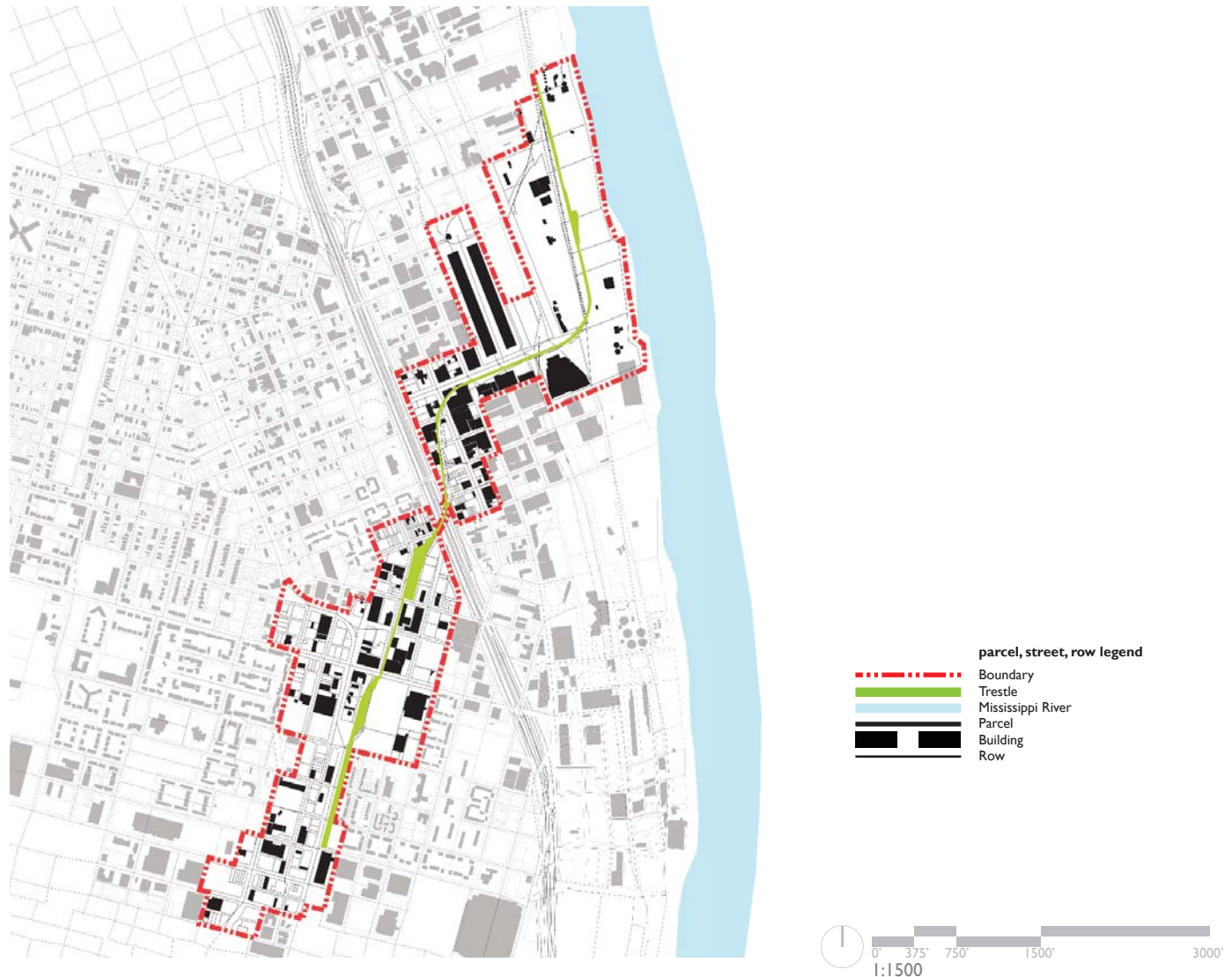


## parcel, street, row

The Fifth Ward's parcels, streets, and right-of-ways are delineated with building outlines as appropriate.

Buildings within boundary provide diagrammatic figure-ground relationship.

Knowing the location of buildings and open spaces provides information on potential sites for development, areas of limited potential, and open spaces. Transportation lines (including interstate highways, state highways, streets, and roads) show deformation of the city grid and potential to expand street networks throughout Fifth Ward. See *f 4.40*.



*f 4.40* parcel, street, row map. illustration created by designer. information from msdis 2008.

**neighborhood**

Eight neighborhoods are located entirely or partially within the Fifth Ward and include a portion of the Riverfront neighborhood to the south (not affiliated to the Fifth Ward). Each neighborhood comprising the Fifth Ward offers various opportunities for development.

High variation in living conditions occur within adjacent neighborhoods of the Fifth Ward. While one may have the lowest household cost in the downtown area, a directly adjacent neighborhood may have the highest cost of living. The high disparity between social conditions suggests a need for social reform while still avoiding gentrification that leads to increased social displacement. See *f 4.41*.

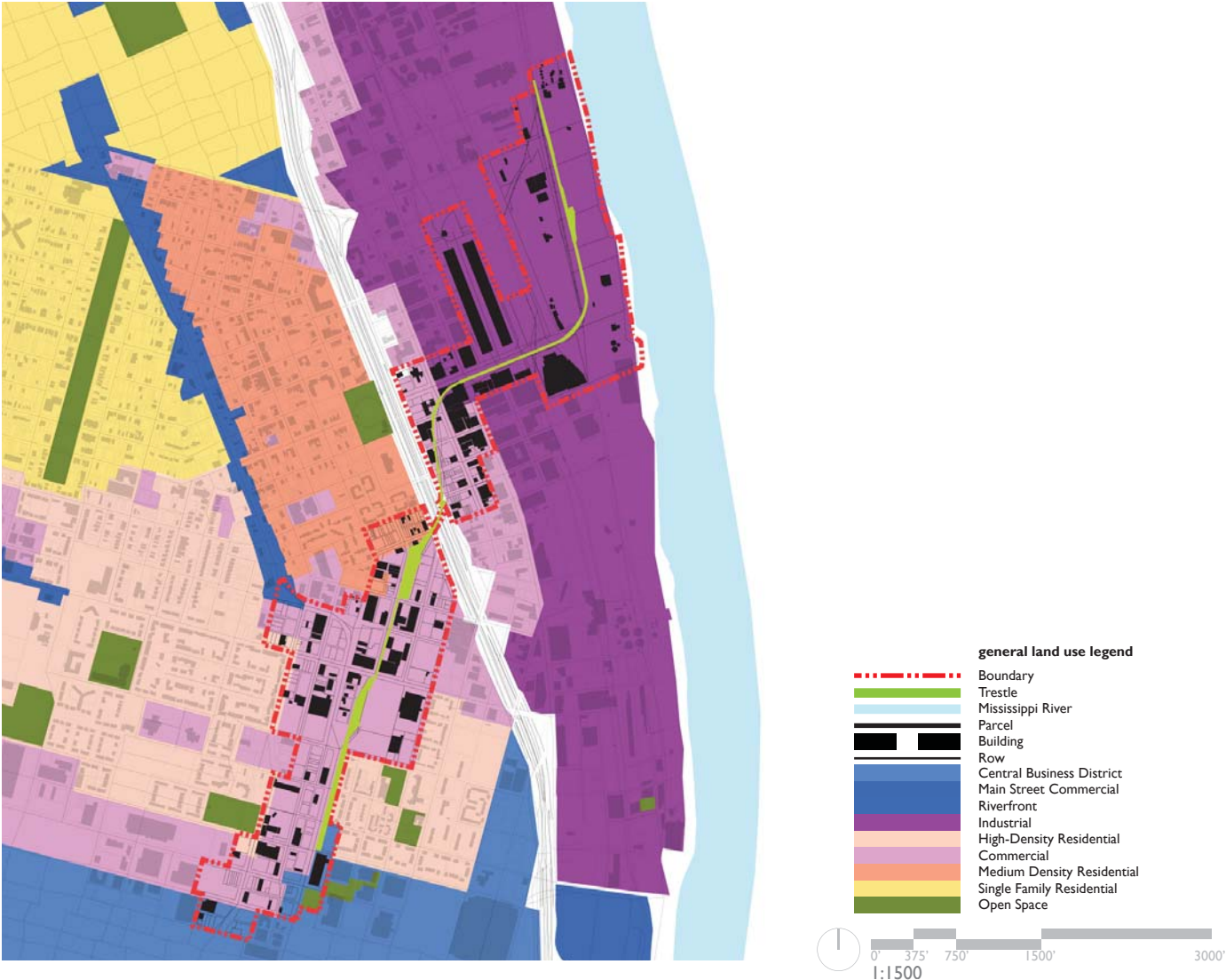


*f 4.41* neighborhood district map. illustration created by designer. information from msdis 2008.

### general land use

General zones of development are noted within the general Fifth Ward area within the delineated boundary and the Trestle. Heavy and light industrial zoning dominates the eastern portions bordering the Mississippi River. Several housing opportunities, including variations of single and multi-unit residential, exist north of downtown. The majority of the commercial district is within the central business district with some also on major routes.

The central business district is located south of the defined downtown area. The majority of residential users are west of the interstate. The typically heavy pattern of zoning suggests segregation exists within various land uses and that a connection could potentially be established to provide for integrated heterogeneity of land uses rather than singular isolated functions. See f 4.42.



f 4.42 general land use map. illustration created by designer. information from msdis 2008



**existing zoning**

Building and parcel designations, specifically within the defined boundary and along or in close proximity to the Trestle line are delineated. Generally, higher residential and commercial districts exist in the defined boundary. Moderate to heavy industry dominates the defined boundary to the north and east while heavy commercial is apparent approaching the southern central business district.

General zoning displays higher residential density outside of the defined boundary. The incorporation of the presently working riverfront could shift dependent upon transportation, technological innovation, changes in supply/demand. However, the current zoning shows a dense clustering of the manufacturing, service, production type. Incorporation of the surrounding community will be essential for successful implementation. See f 4.43.

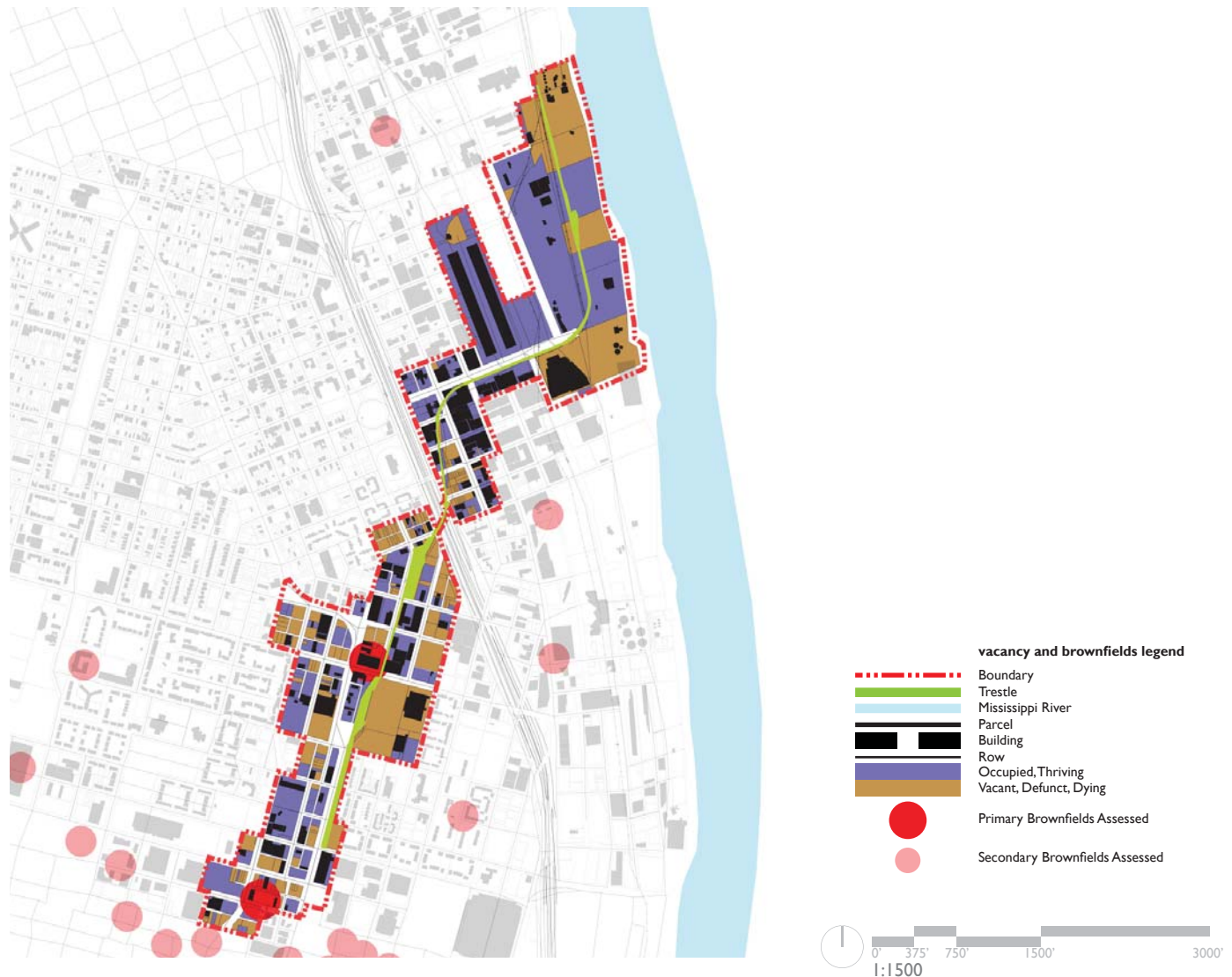


f 4.43 existing zoning map. illustration created by designer. information from msdis 2008

## **vacancy and brownfields**

Vacant and non-vacant lots are delineated in relationship to city defined brownfields existing in close proximity to boundary and Trestle. Vacancy is common with over 46% of parcels in the whole Fifth Ward defined as 'vacant.' Brownfields are dominant in dense portions in the downtown area, with sporadic points in the commercial and industrial quarters typically on the east side of the interstate highway.

High vacancy rates suggest that there is an outflux of people from the area. Major portions located directly adjacent to the Trestle line are vacant. The two brownfields noted as 'primary brownfields assessed' provide an ideal point of an socio-economically efficient, ecological sustainable catalyst point for initiating redevelopment. See f 4.44.



f 4.44 brownfield map. illustration created by designer. information from msdis 2008



### pedestrian sheds

Typical quarter-mile walking distances noted from Trestle line are delineated. The longest walkable distance is defined as a five-minute walk from one point to another, or approximately a quarter-mile. Topography is of limited concern, and thus the similar circular shapes.

Walkable distances establish typical acceptable boundaries. While the defined boundary does not coincide directly with the walkable distances, pedestrians can easily move from one point to another if development were to occur on and within close proximity of the defined boundary and Trestle line. See f 4.45.

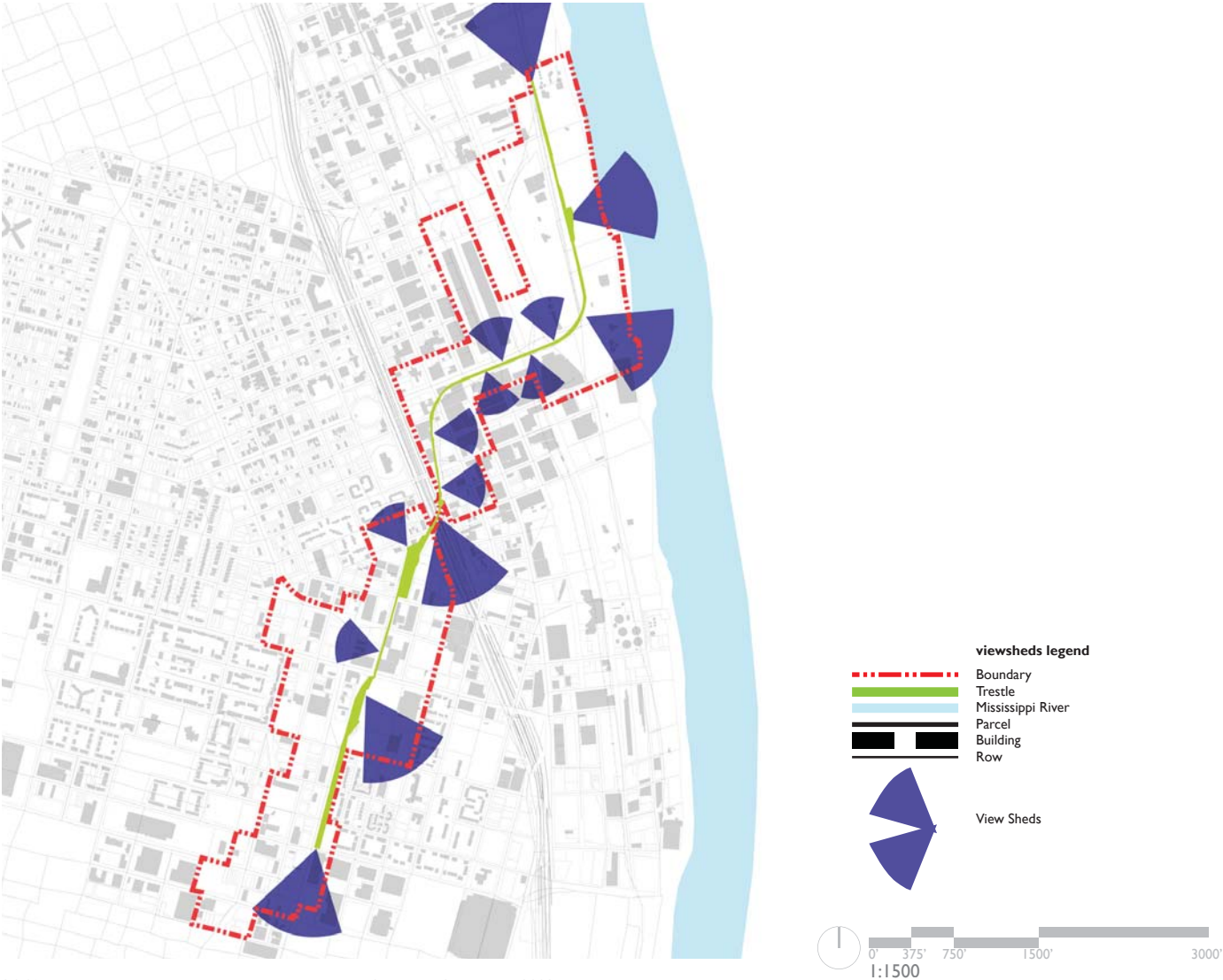


f 4.45 pedestrian shed map. illustration created by designer. information from msdis 2008

# view sheds

Typical 60-degree wide angle analysis of potential view shed opportunities. Visual connections exist along the elevated Trestle line, especially at key connection points north at the Branch Street Trestle, northeast at the Mississippi River, throughout the industrial-commercial sector, and at scattered points until the Trestle moves down to grade after crossing the interstate headed southwest.

Primary viewshed occurs from vehicles along the interstate looking to the St. Louis Arch. Other smaller opportunities are noted with limited potential. Visual connection enables pedestrians to locate themselves within a larger urban context. Knowing the potentials for views enhances the programmatic potential for event and functional programming. See f 4.46.

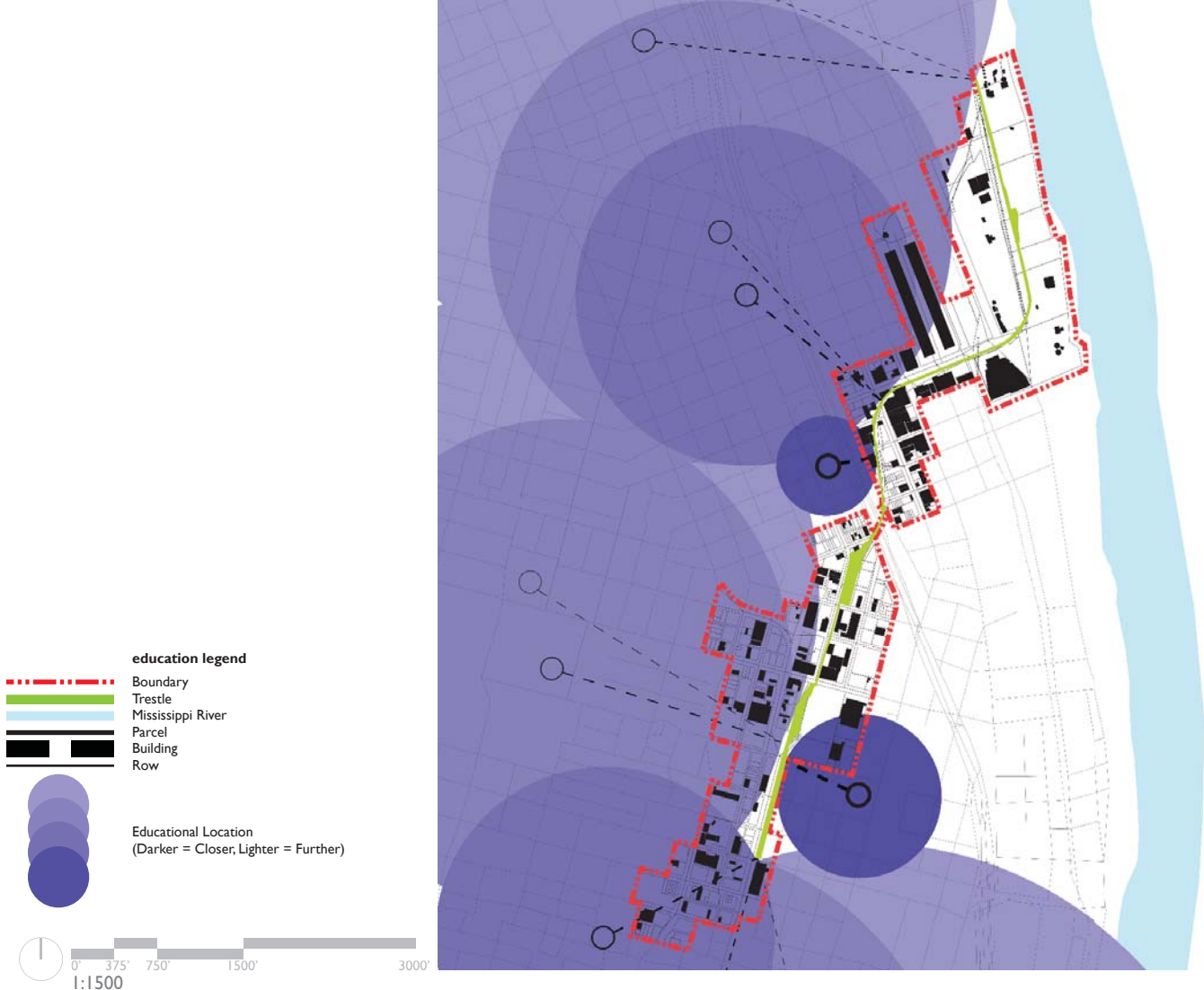


f 4.46 view shed map. illustration created by designer. information from msds 2008

## education

Public and private elementary, secondary, and post-secondary educational institutions are noted in relation to distance from closest point to Trestle line. Majority of educational facilities within Fifth Ward are state-owned, with no college or university in the defined area (though St. Louis University and Washington University are a driveable distance). The closest school exists approximately 500-1000' feet from the line (though could be vacant).

Student and community interaction is essential to sustainability of revitalized Trestle. Must incorporate elements of education and thus require people to be involved in process. Consider further expansion of planning to reach multiple school districts or single academic institutions. Also, examine other types of educational institutions - churches, nature conservancies, daycares, magnet schools - for potential involvement. See f 4.47.

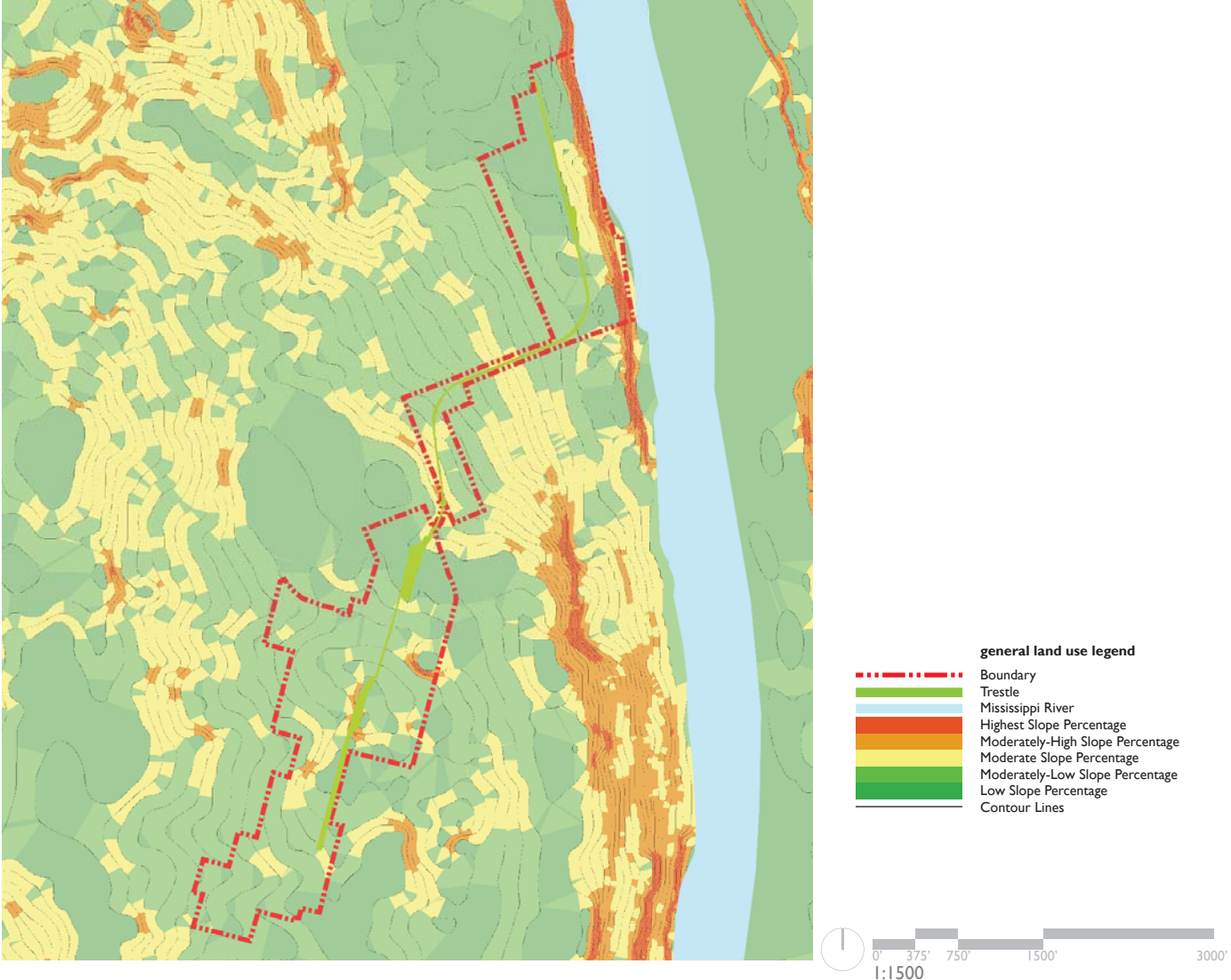


f 4.47 education map relaying position of institutions. illustration created by designer. information from msdis 2008

# landform

The general slope and noted contours are shown within and around the defined boundary and Trestle line. Within a typical urban condition where soils and 'natural' ecological processes including stormwater management have been relegated to purely functional matters, the general slope is relatively minimal suggesting either high potential for structural development in suitable land or high flooding potential within areas of poor drainage. Slope moves generally east towards the river edge, with the majority of increased slope within the Near North Riverfront and Riverfront Neighborhoods.

Slope is fairly minimal within the delineated boundary, but certain low and high points do exist. Areas noted suggest high stormwater runoff and potential to mediate or rectify infrastructural problems. See f.48.



f 4.48 landform and topographical map displaying gradual downwards slope towards riverfront. illustration created by designer: information from msdis 2008

**ecoregions i and ii**

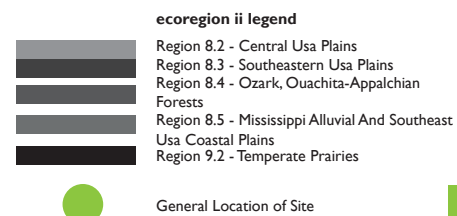
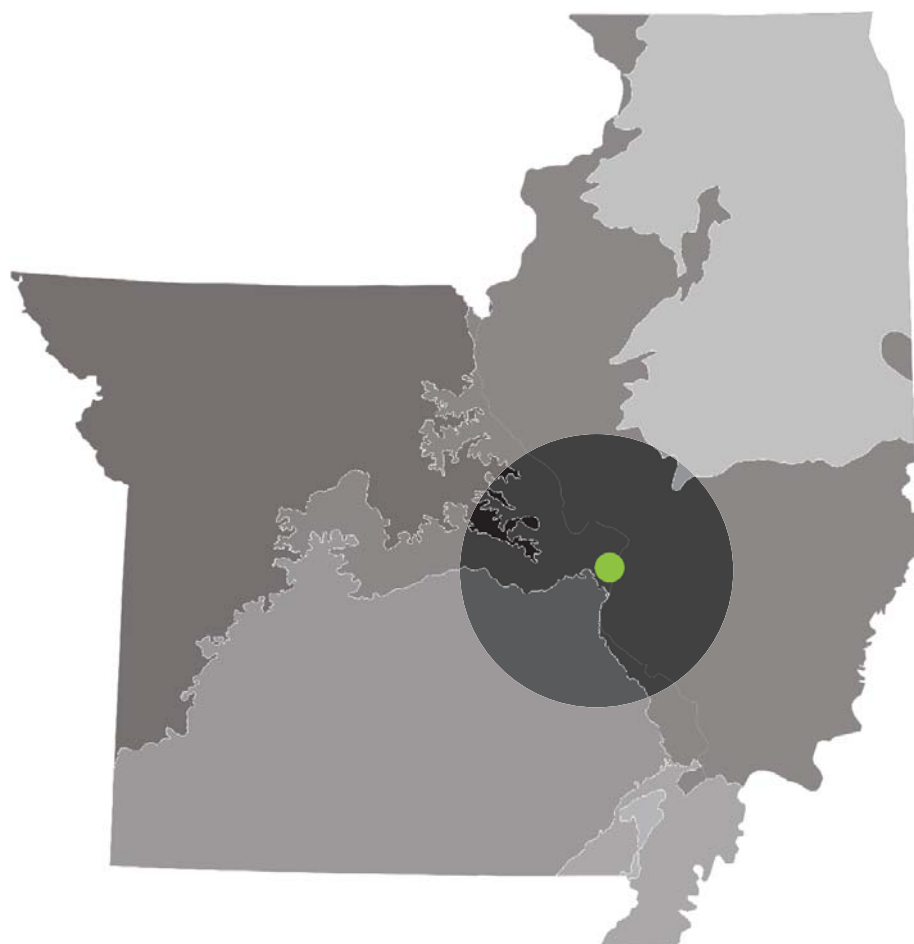
EPA defined Ecoregions I-IV (1-4) are shown for the bounding states of Missouri and Illinois with general site location noted.

Ecoregions, or recurring patterns of ecosystems with characteristic distribution of geomorphological, biological, and soil types, provide a contextual understanding of what the site provides in terms of climate, output, and biological necessities. See *f.49*.

Extending from the Great Lakes to the north to the Gulf of Mexico to the south, the Eastern Temperate Forests region is known for moderate to mildly humid climate, dense and diverse forest cover, and higher density of human to animal ratio with higher quantity of urban industries, agriculture, and forestry activities. Region 9, Great Plains, extends over the widest latitudinal range of any North American ecoregion and is known for relatively little topographic relief, grasslands and forests, and sub-humid to semi-arid climate with high value placed in crop production. See *f.50*.



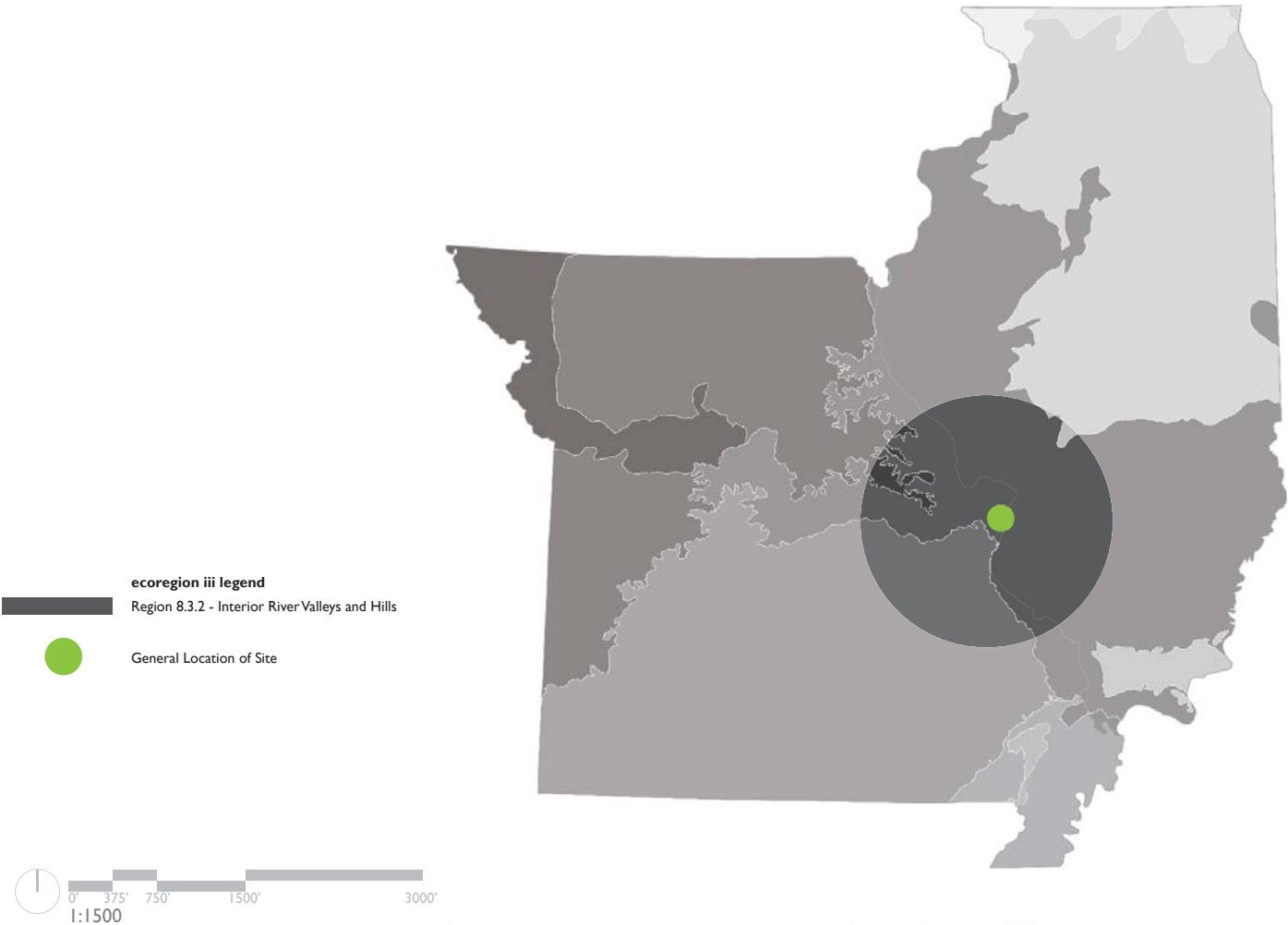




**ecoregions iii and iv**

Missouri has four Ecoregion III classifications while Illinois has seven. Of importance is region 8.3.2, classified as Interior River Valleys and Hills, the main Ecoregion within the Mississippi River Alluvial Valley Ecoregion II. Ecoregion III is intended for enhanced regional environmental monitoring, assessment, and reporting with the specific criteria and characteristics noted in each identified section. See f 4.51.

Ecoregion IV's 72F area contains the Trestle site, with 72D and 72E bordering the northern region and 39D, 39E, 39G, 39I, and portions of 72F and 72E on the southern end of the Missouri side, with similar 72D-F on the Illinois side and 72L. In order to achieve multi-functional landscapes, large ecoregions can correlate to site specific ecosystems and the complex web of interconnected systems. Allowing and enabling ecosystems to interact and coexist can provide for richer biodiversity, sustainability, and integration of processes. See f 4.52.



f 4.51 ecoregion iii map. illustration created by designer. information from msdis 2008

